

VOLUME XVI. No. 3

WHOLE NUMBER 63

PROGRESSIVE MEDICINE

A QUARTERLY DIGEST
OF
ADVANCES, DISCOVERIES AND IMPROVEMENTS
IN THE MEDICAL AND SURGICAL SCIENCES

EDITED BY

HOBART AMORY HARE, M.D.

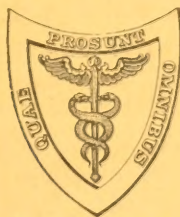
Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College
Philadelphia

ASSISTED BY

LEIGHTON F. APPLEMAN, M.D.

Instructor in Therapeutics, Jefferson Medical College, Philadelphia

SEPTEMBER 1, 1914



OWNERS AND PUBLISHERS

Philadelphia

LEA & FEBIGER

New York

SIX DOLLARS PER ANNUM

Entered March 8th, 1904, at the Post-Office at Philadelphia as second-class matter under Act of March 3d, 1879

NEW (2nd) EDITION

JUST READY

ADAMI & McCRAE'S TEXT-BOOK OF PATHOLOGY

This book reflects the arrangement which the subject has naturally assumed in the minds of the authors after years of study and experience in teaching. Logically, it should afford the simplest and most natural presentation for other minds to follow. In the revision of each subject, the authors have been careful to include all reliable advances which the past two years have brought forth. Wherever possible the text has been improved, and nearly one hundred new illustrations and some new colored plates have been added. In brief, nothing has been left undone to keep this work in the enviable position of the best text-book of pathology in the English language.

A TEXT-BOOK OF PATHOLOGY. For Students of Medicine. By J. GEORGE ADAMI, M.A., M.D., F.R.S., Professor of Pathology in McGill University, Montreal, and JOHN McCRAE, M.D., M.R.C.P. (Lond.), Lecturer in Pathology and Clinical Medicine, McGill University. Octavo, 878 pages, with 395 engravings and 13 colored plates. Price, in cloth binding, \$5.00, net.

NEW WORK

JUST READY

KNOWLES ON THE SKIN

The author has kept prominently in mind the two main objects of every reader — first the making of an early and correct diagnosis, and then the application of the best methods of treatment. In order to render his work of the utmost practical value he has included a large number of clear illustrations most of which are original, and which will prove extremely helpful in the differentiation of various dermatological conditions. His therapeutic recommendations represent the remedies which he has successfully used, and under the common diseases the exact methods of employing them have been particularly emphasized. Special methods have also been carefully outlined.

DISEASES OF THE SKIN, INCLUDING THE ACUTE ERUPTIVE FEVERS. By FRANK CROZER KNOWLES, M.D., Instructor in Dermatology in the University of Pennsylvania; Clinical Professor of Dermatology, Woman's Medical College of Pennsylvania, etc. Octavo, 546 pages, with 199 engravings and 14 plates. Price, in cloth binding, \$4.00, net.

MAIN OFFICE
706-8-10 Sansom St.

PHILADELPHIA

LEA & FEBIGER
PUBLISHERS

N. Y. OFFICE
2 W. 45th Street
NEW YORK

CONTRIBUTORS TO VOLUME III

1914

DAVIS, EDWARD P., M.D.

EWART, WILLIAM, M.D., F.R.C.P.

GOTTHEIL, WILLIAM S., M.D.

SPILLER, WILLIAM G., M.D.

PUBLISHED QUARTERLY

BY

LEA & FEBIGER.

708 Sansom Street

PHILADELPHIA

Subscription price, \$6.00 per annum.

Awarded Grand Prize, Paris Exposition, 1900

PROGRESSIVE MEDICINE

A QUARTERLY DIGEST OF ADVANCES, DISCOVERIES
AND IMPROVEMENTS

IN THE

MEDICAL AND SURGICAL SCIENCES

EDITED BY

HOBART AMORY HARE, M.D.

PROFESSOR OF THERAPEUTICS, MATERIA MEDICA, AND DIAGNOSIS IN THE JEFFERSON MEDICAL COLLEGE,
PHILADELPHIA; PHYSICIAN TO THE JEFFERSON MEDICAL COLLEGE HOSPITAL; ONE TIME CLINICAL
PROFESSOR OF DISEASES OF CHILDREN IN THE UNIVERSITY OF PENNSYLVANIA;
MEMBER OF THE ASSOCIATION OF AMERICAN PHYSICIANS, ETC.

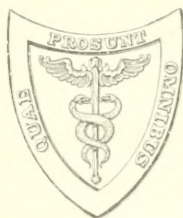
ASSISTED BY

LEIGHTON F. APPLEMAN, M.D.

INSTRUCTOR IN THERAPEUTICS, JEFFERSON MEDICAL COLLEGE, PHILADELPHIA; OPHTHALMOLOGIST TO
THE FREDERICK DOUGLASS MEMORIAL HOSPITAL; INSTRUCTOR IN OPHTHALMOLOGY, PHILA-
DELPHIA POLYCLINIC HOSPITAL AND COLLEGE FOR GRADUATES IN MEDICINE.

VOLUME III. SEPTEMBER, 1914

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS
AND BLOODVESSELS—DERMATOLOGY AND SYPHILIS—OBSTETRICS—
DISEASES OF THE NERVOUS SYSTEM.



LEA & FEBIGER

PHILADELPHIA AND NEW YORK

1914

Entered according to the Act of Congress, in the year 1914, by
LEA & FEBIGER,
in the office of the Librarian of Congress. All rights reserved.

LIST OF CONTRIBUTORS

JOSEPH C. BLOODGOOD, M.D.,

Associate Professor of Surgery, Johns Hopkins University, Baltimore, Md.

CHARLES W. BONNEY, M.D.,

Assistant Demonstrator of Anatomy in the Jefferson Medical College, Philadelphia.

JOHN ROSE BRADFORD, M.D., F.R.C.P., F.R.S.,

Professor of Medicine in University College and Physician to the University College Hospital, London.

JOHN G. CLARK, M.D.,

Professor of Gynecology in the University of Pennsylvania, Philadelphia.

WILLIAM B. COLEY, M.D.,

Professor of Clinical Surgery, Cornell University Medical School; Attending Surgeon to the General Memorial Hospital; Attending Surgeon to the Hospital for Ruptured and Crippled.

FLOYD M. CRANDALL, M.D.,

Consulting Physician to the Infants' and Children's Hospital; Late Visiting Physician to Minturn Hospital, New York.

EDWARD P. DAVIS, M.D.,

Professor of Obstetrics in the Jefferson Medical College of Philadelphia.

ARTHUR B. DUEL, M.D.,

Professor of Otolaryngology, New York Polyclinic Medical School and Hospital; Aural Surgeon to the Manhattan Eye, Ear, and Throat Hospital, and to the Polyclinic Hospital; Otolaryngologist to the Babies' Hospital; Consulting Aural Surgeon to the Skin and Cancer Hospital, and to the New York Health Board Hospitals.

WILLIAM EWART, M.D., F.R.C.P.,

Consulting Physician to St. George's Hospital and to the Belgrave Hospital for Children, London.

CHARLES H. FRAZIER, M.D.,

Professor of Clinical Surgery in the University of Pennsylvania; Surgeon to the University, Howard, and Philadelphia Hospitals.

JOHN C. A. GERSTER, M.D.,

Instructor in Surgery, New York Polyclinic Hospital and Medical School; Adjunct Surgeon to Mt. Sinai Hospital; Assistant Surgeon to Knickerbocker and City (Blackwell's Island) Hospitals.

EDWARD H. GOODMAN, M.D.,

Associate in Medicine, University of Pennsylvania; Assistant Physician, University Hospital and Philadelphia General Hospital; Consultant to the Medical Dispensary, University Hospital.

WILLIAM S. GOTTHEIL, M.D.,

Adjunct Professor of Dermatology, New York Post-Graduate Medical School; Consulting Dermatologist to Beth Israel and Washington Heights Hospitals; Visiting Dermatologist to the City and Lebanon Hospitals, New York City.

EDWARD JACKSON, M.D.,

Professor of Ophthalmology in the University of Colorado; Ophthalmologist to the City and County Hospital of Denver.

H. R. M. LANDIS, M.D.,

Director of the Clinical and Sociological Departments of the Henry Phipps Institute of the University of Pennsylvania; Assistant Professor of Medicine in the University of Pennsylvania; Visiting Physician to the White Haven Sanatorium.

GEORGE P. MÜLLER, M.D.,

Associate in Surgery in the University of Pennsylvania; Professor of Surgery in the Philadelphia Polyclinic and College for Graduates in Medicine; Surgeon to the St. Agnes and Polyclinic Hospitals; Assistant Surgeon to the Hospital of the University of Pennsylvania; Consulting Surgeon to the Chester County Hospital.

JOHN RUHRÄH, M.D.,

Professor of Diseases of Children and Therapeutics, College of Physicians and Surgeons; Visiting Physician, Robert Garrett Hospital, Nursery and Child's Hospital, Mercy Hospital; Consulting Physician, Church Home and Infirmary, Baltimore.

WILLIAM G. SPILLER, M.D.,

Professor of Neuropathology and Associate Professor of Neurology in the University of Pennsylvania; Clinical Professor of Nervous Diseases in the Woman's Medical College of Pennsylvania.

ALFRED STENGEL, M.D.,

Professor of the Theory and Practice of Medicine and Clinical Medicine in the University of Pennsylvania, Philadelphia.

GEORGE B. WOOD, M.D.,

Surgeon to the Department of the Nose, Throat, and Ear, Howard Hospital; Assistant Laryngologist, Orthopædic Hospital.

CONTENTS OF VOLUME III

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS	17
By WILLIAM EWART, M.D., F.R.C.P.	
DERMATOLOGY AND SYPHILIS	113
By WILLIAM S. GOTTHEIL, M.D.	
OBSTETRICS	165
By EDWARD P. DAVIS, M.D.	
DISEASES OF THE NERVOUS SYSTEM	279
By WILLIAM G. SPILLER, M.D.	
INDEX	331

PROGRESSIVE MEDICINE.

SEPTEMBER, 1914.

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS.

By WILLIAM EWART, M.D., F.R.C.P.

TUBERCULOSIS.

WITHIN the scope of this report, the most far-reaching contribution of the last twelve months, next to Alexis Carrel's heart-clamping experiments, to James B. Murphy's heteroplastic transplantations of neoplasms, and to Abel, Rowntree, and Turner's "Vividiffusion of the blood," is the striking revival of the Medicinal treatment of Tuberculosis in the shape of the "Intensive Iodine Therapy" of L. Boudreau, and of the "Nascent Iodine Therapy" of David Curle. This cannot fail to tell upon the general therapeutical currents which have prevailed for many years in the management of pulmonary tuberculosis. Yet the final word has not been said for bacillotherapy.

As we conclude these pages, comes the announcement of the discovery of a new treatment by a young Swiss lawyer, Henri Spahlinger, a report of which was presented to the French Academy of Medicine on April 28, and was most favorably received. It is now being tried at four London hospitals, with encouraging results. The method consists in intramuscular injections containing both an antigen and ferments: the effect of the latter being to dissolve the wax envelope of the bacillus and render it accessible to the white corpuscles and ferments of the blood. For febrile cases, additional carefully graduated intramuscular and intravenous injections are made of ferments in special combinations with lipoids. During the expectant interval which must intervene, it may be opportune to glance back at the latest phase of the tuberculin question immediately antecedent to that new idea.

The Etiology and Morbid Anatomy of Human Tuberculosis. T. Shennan's study¹ contains valuable data on the comparative death rate for

¹ *Lancet*, February and March, 1914.

ages and localities, particularly in Scotland. Special interest attaches to his conclusions relating to hypersensitiveness, and to reinfection, which he believes is often not autogenous. According to him, most infections of the lungs and their glands are aërogenous. Retrograde infections occur, but there is no evidence of a spread by direct continuity from the deep cervical glands to the lungs. The right lung and its regional glands are more often affected than the left. In children, pulmonary tuberculosis is frequently a sequel of tuberculosis of the bronchial glands. Little is known of the factors which determine the localization in the lung. Chronic fibrocaceous foci and caseation of the related glands may be caused by separate infections. In Scotland, bovine infections in childhood are commoner than in most other parts of the world. The relative frequency with which bovine or human infections occur in any given organ or tissue, and the incidence of these infections, vary in different localities.

Is the Etiology of Cystic Neoformations Connected with Tubercle? Noting the frequency of latent tuberculosis in goitrous subjects, and the histological identification, reported by several observers, of tubercle in apparently simple goitre, A. Poncet and R. Leriche¹ have set themselves the task to show that adenomatous proliferation of the thyroid is a local reaction to tuberculosis, and further, to generalize that thesis, in special connection with the pathology of ovarian cysts, into a conclusion that "inflammatory tuberculosis" is probably the cause of many benign cysts. They base that conclusion upon their observation that tuberculosis of the tubes is often associated with ovarian cysts which show no tubercle, but which they believe to be an ovarian reaction to the tubercular process.

The Earliest Seat of Pulmonary Infections. From extensive radiographic observations of a "mottling," radiating from the root of the lung, as the first and truly diagnostic sign, Alfred C. Jordan² derives the conviction that the disease starts as a "diffuse bronchial catarrh," with secondary lymphatic implication, prior to any apical settlement; the bacilli raising small foci of leukocytic infiltration along the bronchial tree. Similar appearances in the healthy suggest some obsolete former infection. This is a bold pathological proposition which doubtless will be submitted to searching clinical criticism.

The Immunity of Tolerance described by Todd and Adami³ is not a specific *Sterilisatio magna* which can suppress the parasite. It is a partial protection, from mithridatism, due to a long continued, or to a frequently repeated infection by some parasite; it disappears when the sufferer escapes from his tropical environments, and loses his in-dwelling parasite. He then once more becomes liable to the worst effects of the old infection. That partial self-immunization is analogous to, and

¹ Lyon Chir., January, 1914.

² Lancet, April 4, 1914.

³ Canadian Medical Association Journal, February 4, 1914.

practically of the same order as, the improved resistance conferred by active function, upon the lung for instance, by an active respiratory hygiene. It is in that sense that we use the term "functional immunity of organs." Therefore, Todd and Adami conclude that the apparent immunity, which can be acquired against the parasites causing many diseases, is often the result of a tolerance for those parasites, acquired by the host. The tolerance is maintained by a constant infection by the parasite and it disappears when the infection maintaining it ends. A constant infection on which tolerance depends may conceivably result (*a*) from a long-continued single infection, or (*b*) from many repeated infections. It is possible that tolerances may be produced in both, or either, ways.

The pathogenic action of those organisms which, unlike the bacillus of diphtheria, or of tetanus, produce no demonstrable exotoxin is not easily explained. Thiele and Embleton's¹ experiments suggest that it depends on the amount of toxic protein-cleavage products which may be formed by the action of antibodies on the bacterial protoplasm. Non-pathogenic organisms are made pathogenic by raising the antibody activity against them. For instance, this was accomplished by giving a very large injection of killed organisms to guinea-pigs, and, after a period of from five to fifteen days, inoculating the guinea-pigs with a small quantity of the living bacteria. Animals so treated died in two or three days of intoxication, whereas control animals gave no toxic symptoms. This tends to show that the pathogenicity of bacteria depends on the activity of the antibodies or ferments in the system of the host. If such activity is either very slight or very high, the organism is non-pathogenic. By increasing or decreasing the antibody activity in the respective cases, these bacteria may be made pathogenic.

They also note that many non-virulent organisms, on being made virulent, develop a capsule. They explain this as follows: When a ferment comes into contact with an albuminous substance which it can attack, it will gradually penetrate it; if this substance is a living bacterium, it is destroyed. If, however, the bacterium develops a protecting capsule, it can survive. This confirms the view that the mechanism of pathogenicity and virulence is closely connected with changes in the activity or allergy of the host.

Abderhalden's Serodiagnosis. A question of priority having been raised by F. Hamburger who complains that his previous work has been passed *sub silentio*, Abderhalden² explains that the original idea of biochemical protections, or of protective ferments, really dates farther back, to 1896, when Huppert published his views on the conservation of specific properties in the organism.

¹ Proceedings of Royal Society of Medicine, 1913, vi, 99. *Zeits. f. Immunitätsforsch. u. exper. Therap.*, 1913, xix, 643.

² *Wien. med. Woch.*, January 29, 1914.

Transudation of Ferments as a Novel Vascular Function. R. Lépine¹ enlarges upon Debré and Paraf's recent method of demonstrating, by means of some known antibody, the presence of an antigen in tuberculosis in the urine, sputum, or local exudates, when bacilli cannot be found. This is of great practical advantage for the unilateral diagnosis of renal infection, and also as the only means of differentiating simple orthostatic albuminuria. In pulmonary tuberculosis, when chronic it is generally negative, when acute, positive. In renal tuberculosis it is always exclusively positive. But it fails in blood serum and cerebrospinal examinations.

Tuberculin. SAHLI'S VIEWS ON TUBERCULIN may be condensed as follows from his paper in the *Lancet* (August, 1913). (1) All tuberculins are essentially identical. Their active principle is the protein of the bacilli. There is no proof of the existence of an exotoxin. The failure to produce high sensibilization by previous tuberculin infection in healthy animals is no argument against tuberculin being actually the toxin of tuberculosis. The best tuberculins are those as free as possible from adventitious albumins; (2) for safety it is advisable to provide tuberculin in suitably graduated dilutions, as in the Beraneck's method. The concentration of the dilution is also of importance; (3) diagnostic injections are dangerous and unreliable, both positively and negatively. The only procedure he advises is the cutaneous reaction with graduated dilutions to determine the tuberculin sensibility, in order to fix the proper initial dose; (4) tuberculin treatment is free from danger only if strong reactions be avoided. It may be undertaken for prophylaxis in cases where the infection is probable, although the disease is quiescent. Only this mild method can give all the benefit derivable. Tuberculin treatment is chiefly valuable in incipient cases; (5) in advanced cases, tuberculin may produce some symptomatic effect; but this is not to be compared with its utility in incipient cases; (6) therefore the family physician should be proficient in tuberculin treatment; (7) correct treatment is only possible with a thorough knowledge of the action of tuberculin; (8) the therapeutical action is essentially of the same kind as the tuberculin reaction; stimulation of the natural healing, and an increased production of "inflammatory antibodies" and of the specific tuberculin amboceptor. The latter raises the local counteraction by producing tuberculinopyrin, and the general detoxication of the pre-formed tuberculin by splitting the latter into harmless products. Hence the defervescence; (9) tuberculin acts favorably only when the human organism is not already sufficiently under the influence of absorbed tuberculin, that is, generally in slighter cases; (10) it is not necessary to increase the doses of tuberculin to the furthest limit of tolerance. A much smaller dose is often the optimum individual dose. This

¹ Revue de méd., February, 1914.

optimum dose ought not be overstepped; (11) the large doses recommended recently have no curative action. The reduction of the temperature in these cases depends only on an artificial production of an antianaphylactic state, that is, the same condition of things which causes the advanced cases not to react to tuberculin; (12) tuberculin, though not capable of a true immunization, produces immunizatory effects in the organism. Actual immunization is a "state" of immunity. This is impossible of attainment in tuberculosis. From tuberculin one gets only stimulation and activation of the counteractions of the body at each injection. This mode of action Sahli has called an "immunizatory healing action," in opposition to actual immunization, which is a final state; (13) all localized tuberculosis is suitable for tuberculin treatment, provided the patient is not already overloaded with tuberculin, and, therefore, too seriously ill. As a rule, acute cases cannot be treated by tuberculin; (14) treatment by multiple cuti-reactions, after the method described by Sahli at the International Congress on Tuberculosis in Rome, 1912, has proved harmless, and useful especially for incipient cases. It is based on the principle of enlarging the reactive surface. The strongest local (cutaneous) reaction is produced with the smallest amount of tuberculin; (15) well-diluted tuberculin treatment constitutes a real and great therapeutic progress.

A CONTRIBUTION TO THE CRITICAL STUDY OF TUBERCULIN RESULTS, AND OF THERAPEUTICAL STATISTICS. Prof. H. Sahli's remarks¹ are in the nature of a criticism of Battey Shaw's views² on the present evidence for and against the use of tuberculin as a specific cure. Any parallel between tuberculin and antitoxin treatment is altogether inadmissible. That inapt comparison as equivalents is a constant source of confusion, and of an incorrect use of tuberculin. That Koch had made a mistake in the interpretation of his results is fully recognized. The fact that in spite of it tuberculin, with a radically altered method and theory, is coming into increasing use is due to a useful kernel, which he had been unable to isolate, but which has since been isolated through immense clinical and experimental work (cf. Sahli's works). It is not admissible to ignore that work. There is also a grave injustice in Battey Shaw's comparison between the quack doctor's lack of criticism and a similar lack which he charges to the tuberculin therapist. Sahli then passes on to some of the theoretical points which seem specially questionable.

In the first place, as regards "exclusion," the action of tuberculin, and therefore of its amboceptor, really extends into the interior of the remotest tubercles, as clinically and anatomically established by the focal reactions. Again, it is incorrect that anaphylatoxin is a combination of complement, amboceptor, and antigen. Battey Shaw's view

¹ British Medical Journal, April 11, 1914.

² *Ibid.*, May 3, 1914.

that, in anaphylactic phenomena, no curative side is to be recognized, is hardly in unison with physiological thought. The more favorable course of relapses in pneumonia, erysipelas, etc., cannot be considered simply as evidence of immunity in the face of the frequency of such relapses; must it not rather be attributed to the curative action of anaphylaxis, or better of hypersensitiveness (allergy)? And are not the rapid and abbreviated course of revaccination in comparison with primary vaccinia (von Pirquet), and the stormy but curative course of tubercular infection in the case of cattle previously treated by Behring's method (Römer), or of the reinfection of already tuberculous animals (Koch, Römer), incontrovertible examples of the curative action of allergy? This anaphylactic activating of the protective mechanisms is properly a "phylaxis," and deserving of the more correct term "allergy." Sahli has proved that, by rational dosage, the curative element may be isolated from the harmful in the allergic phenomena and used in the interests of therapy.

The significance of the modern reactionless tuberculin treatment appears to be little recognized by Batty Shaw. The old argument is scarcely used nowadays, that tuberculin treatment is an immunization, and that, from the possibility of a protective inoculation against typhoid (the author might as well have said against any bacterial inoculation in general), it might be concluded that such an inoculation must also succeed in the case of tuberculin. To refute this obsolete argument, he calls attention to the essential difference in regard to immunization when the individual is healthy, and when he is already infected. Here again the author pushes an already open door. No thoughtful tuberculin advocate nowadays contends that it immunizes. Its therapeutic action is fundamentally distinct from immunization, and, in a certain sense, the converse of it. There exists in fact no actual immunity against tuberculosis. But this does not in any way minimize the value of tuberculin treatment.

STATISTICS; OLD AND NEW; WHOLESALE AND MINIATURE; COARSE AND FINE: "*Le Mensonge des Chiffres*." Battey Shaw, says Sahli, has lost his faith in the older statistics because in them the cases specially suited for this treatment were selected. To clear up that objection he takes up their defence, although in the tuberculin question he has himself given up any statistical proof. That selection of cases is a *conditio sine qua non* for rational tuberculin treatment, cannot be set aside. Relapses after tuberculin treatment are no evidence against its value. Is not spontaneous recovery also frequently followed by relapse? How could more be demanded from tuberculin than from the spontaneous cure, as its action is none other than a natural healing "assisted?" The method used for Shaw's miniature statistics render them useless, even apart from the question of principle as to how statistics should be drawn up in order not to obscure the truth. Out of a

number of cases which had been noted by "tuberculin advocates" as suited for tuberculin treatment. Shaw treated the one-half with, the other without, tuberculin. The separation of those two groups, he expressly emphasizes, was left entirely to chance. The first cannot help to decide the question of the value of modern tuberculin treatment, because reactions were allowed to occur.

In the second series, reactions were avoided; but most of these cases were febrile. It was too small, and the period of observation—three months—was altogether insufficient in order to assess the cases. Sahli cannot recognize the value, the necessity, or the relevance of such statistics at all. He holds that the alleged control of the tuberculin results, by simultaneous untreated cases of similar category, is altogether misleading. His own monograph has emphasized the uselessness of the statistical method in general for judging the value of tuberculin. In principle, a determination of treatment "by lot" could only be permissible if every particular case in the whole statistics (the treated and the untreated) were stringently chosen so as to offer some prospect for tuberculin treatment. There is indeed some reason to assume that the cases were chosen unfavorably, so many having proved febrile, and therefore unsuitable.

A second grave error is to determine in advance a case for tuberculin treatment, and then to carry it on through thick and thin. The foremost principle is that this should be at once stopped if not helping the patient. Yet in none of the statistical tables is the statement made that tuberculin was omitted when the patient became worse. Material containing errors of method cannot be employed for statistical use in a therapeutic question.

The probable reply is that, with so stringent a use of logic, any statistical method involving division of the cases by lot, is impossible. Sahli entirely agrees with that view. Tuberculosis is less suited than anything else for statistical use, because the cases are so unlike as to be unclassifiable, and because everything depends upon the individual capacity of reaction, which in any particular case cannot be foreseen.

How, then, under such difficult conditions, shall any therapeutic conviction be attained? The answer must be that digitalis or any other drug teaches the practitioner a correct therapeutic deduction. If, in any cases, from the moment of application of the therapy, whether this be digitalis or tuberculin, improvement sets in, his safe conclusion is that this therapy is useful. On those lines only can we be convinced of the value of digitalis, and likewise of tuberculin in its proper sphere.

In serum therapy there are obvious reasons for the choice of the statistical method, because here it is a question of a direct antitoxic treatment, which needs no particular selection of cases and no particular intelligence to carry it out. In the clinical method of their therapeutic observation the statistical opportunity is that, in some of

them, after the treatment has been commenced, a change is noted which was not to be expected, and, further, that this occurs so frequently that a chance coincidence is excluded. That kind of statistics, not commonly mentioned, might be called "fine statistics" in contrast to the *coarse* therapeutic statistics which we should discard. It permits of the correct application of the principles of probability on which every statistical conclusion is really based, by taking into consideration the factor of coincidence in time. This method incidentally has the advantage of giving reliable results even from a limited material. It is the practitioner's method, and without it no rational therapy could have been developed. To convince the reader there is no need of tables. It is not only sufficient, but imperative, to do that which has here been left undone—to give detailed and critically stated accounts of cases out of which the reader can work out the fine statistics, which he is in the habit of noting in his own practice. The difficulties of any firm therapeutic judgment from published cases are the variety in the standards which any critical reader imposes upon himself, and the variability of the author's standards according to his personal medical culture. Sahli's oft-repeated statement of the tuberculin question, is that "therapeutic conviction, in contrast with almost all other human knowledge, can hardly be transmitted, but is almost exclusively attainable by personal observation."

TUBERCULIN TREATMENT AS THE ESSENTIAL METHOD OF DISPENSING SANATORIUM BENEFIT. Camac Wilkinson's¹ strongly argued thesis, which he opens by quoting Löffler's encomium of the Tuberculin Dispensary, is that the Sanatorium, too often a failure, is the most expensive of methods. The Parliamentary grant of two and one-half millions sterling can provide relief for 20,000 at most, out of 300,000 that need it. In support of Löffler's belief in the simpler and cheaper system, he gives his own results in 100 unselected cases in 1912, under the three essential aspects of diagnosis, treatment and prophylaxis.

For diagnosis, tuberculin is often the only means. It cannot do any harm to those free from tubercle; the only effect may be a gain of two to three pounds in weight. Its positive verdict is not its only use. The negative test, too, is most valuable for its saving of anxiety, expense, and wage-earning time. It enables him to exclude tuberculosis in 9 out of 46 cases tested. His material was all genuine; and he is careful to establish that 95 per cent. of his cases treated belonged to Classes III and IV.

As Regards Treatment. Tuberculin is not a cure for starvation; food is a *sine qua non*, and extra supplies of milk were given. Both drugs and open-air methods have their value; but they were avoided, for the sake of clearer conclusions. Wilkinson's plan is to begin with small

doses of bovine preparations, and then proceed to the stronger tuberculins made from tubercle bacilli of the human type. In the majority of cases, we consider that a dose of 1 c.c. old tuberculin without reaction is sufficient for the first course. It is not always sufficient. It often produces great improvement; but still greater improvement can sometimes be secured by giving also a course of treatment with bacillary emulsion.

The number of cases of tuberculosis treated, including pulmonary tuberculosis, was 55. Of these, 50 received at least 1 c.c. of old tuberculin. One patient had, in addition, 2 c.c. T. E., one had 3.3. c.c. T. E.; and one, 1.5 c.c. T. E. The remainder received 0.5 c.c. of either P. T., or old tuberculin. All but two were benefited. One was neither better or worse, and one was worse after treatment. The bacilli disappeared in more than 50 per cent. of the cases in Stage I and Stage II. There is no record of a patient being seriously ill after a reaction; nor any evidence that tuberculin, given in large doses, made the patient worse rather than better.

For *Prophylaxis*, there is the best evidence that tuberculin favors the healing of the lung, so that tubercle bacilli no longer escapes from the tissues; and that it converts infectious into non-infectious cases on a much larger scale than the sanatorium. The success often attained by tuberculin treatment alone, when administered on this efficient plan, is such that a wise policy should first try what can be done at tuberculin dispensaries, so that money shall not be thrown away upon sanatorium methods unnecessarily. The minimal plan has been a partial, perhaps a complete, failure; large doses a success, and not alone in pulmonary disease. An exception has to be made for advanced lupus; but discharging sinuses are remarkably benefited. He strongly recommends the remedy in uncomplicated tuberculosis, whether in the lung or elsewhere. He is convinced that, for Stages I and II, it can do more than the sanatorium, especially if the patient's occupation is in cities. Hence the need for farm colonies, and after-help. After large doses, relapses are less frequent and occur later. The Tuberculin Dispensary is the essential method for the masses under the Insurance Act. He criticises the panel system as negating efficient treatment by sanatorium or by tuberculin; and also the appointment to dispensaries, of Public Health Officers, whose work lies elsewhere. The Labor Party should see that the money voted against sickness should not be spent over public health departments. Under a bureaucracy the best machine becomes obsolete; and a panel doctor may be converted into a machine of inferior production. As the Special Committee gives the first place to Sanatoriums, financially an inevitable failure, it remains for the Approved Societies to save the Act by insisting, before the construction of any new sanatoria, upon an inquiry into the results of sanatorium benefit, to show how many cases have sought relief, how many have

been treated, by what system of treatment, and with what success. This would probably justify his contention.

The Friedmann Cure and Its Status in Germany. The latest verdict emanates from the Association of German Sanatorium physicians after a visit to the Friedmann Institute. It is quoted by S. A. Knopf in a letter to the *New York Medical Journal*, April 18, for the benefit of American investigators: "We were of the unanimous opinion that the cases shown by Friedmann had been clinically very badly observed, and as a whole could not be considered as successes or cures. We were astonished that no carefully recorded temperature and weight curves were shown. The x-ray plates which were shown to us as evidence of cures did not actually prove anything whatsoever. We will admit that some cases did make an impression upon us, *but here we must also remember that such cases are apt to occur without any treatment, or with any kind of treatment*, and that their number was *altogether* too small to permit a favorable judgment of the value of the remedy." Professor L. Brauer, after trying the serum at Hamburg, says: "The pulmonary cases tested in the Eppendorfer and Salemburg hospital did not improve; but some of them were the worse for the treatment. Five cases of bone and joint tuberculosis in children, treated with the serum by Trepler in the Salemburg institution, were not influenced at all by the treatment; and, in one case, although the movement of the afflicted joint increased, the general condition of the lesions was rendered worse."

Friedmann's Tubercle Emulsion. Following upon the discouraging report of Prof. Vulpius, Frau Prof. Rabinowitsch-Kempner¹ has published her examination and cultures of the contents of the tuberculin ampulle supplied. These disclosed non-acid-fast bacilli, cocci, and, in one instance, streptococci. Of ten of them, six contained bacteriological impurities, which imply pathogenic risks. Her inoculations disprove the assertion that the material is absolutely non-virulent to mammals. In contrast with previous experience with all reptilian bacilli hitherto tested, it proved pathogenic to some of the rabbits and guinea-pigs inoculated, a telling comment upon Friedmann's prophylactic inoculations of infants and school children. She strongly urges Vulpius' recommendation that the manufacture of the emulsion should be placed under State control. Yet more recently Prof. Brauer,² of Hamburg, has published his unfavorable experience, and his disapproval of the voluntary support given by some authorities to Friedmann; and Drs. Gangele and Schüssler their yet more damaging clinical results in children; including many abscesses, an acceleration of the disease, and, in one case, of death.

The Diagnostic Value of Besredka's Antigen in the Complement-fixation Test for Tuberculosis was studied, at his request by A. C. Inman of the

¹ British Medical Journal, 1914, vol. i, p. 934.

² Ibid., p. 993.

Brompton Hospital, with antigen sent direct from Paris in sealed and refrigerated tubes, with satisfactory results. His conclusions¹ are as follows: (1) The antihemolytic power of tuberculous serum can be made manifest in a hemolytic experiment by introducing Be redka's antigen into the mixture. (2) Repeated positive reactions, especially with a 32-fold serum dilution, in the absence of a positive Wassermann reaction, indicate the presence of an active tuberculous lesion. (3) Repeated negative reactions indicate its absence of any such, if cases of under twelve months' duration be excepted.

A Daily Weight Chart is used by H. Warren Crowe for the regulation of "Tuberculin." A fall points to a negative phase and to a reduction in the dose; a continued rise, to a favorable response and to an increase in the latter. The weighings need, of course, to be scientific; but he avers that the method is easy, as well as accurate and delicate.

Laryngeal Tuberculosis and the Sanatorium. Climate is rightly acknowledged as of primary concern. The staunchest believers in the efficacy of the Sanatorium for the treatment of phthisis irrespective of climate, admit a reservation in tubercular laryngitis. But, so far as the masses are concerned, this remains inevitably platonic and non-effective. That major indication is not the only one we still fail to fulfil. Waiving, perforce, the climatic clause, we do recognize an essential difference in the therapeutical requirements. This also remains a dead letter. The "Throat Hospital" has long passed its majority, but we have not yet heard of its indispensable, institutional adjunct for cure and prevention, even in the largest cities, where numbers are more than sufficient to justify its cost. This is our excuse for addressing to PROGRESSIVE MEDICINE the suggestion of a "Throat Sanatorium" as an urgent need; and for trespassing beyond the boundary of our thoracic department into a neighboring territory.

As a fact there is no dividing line. Where phthisis pulmonalis exists, laryngitis is an ever-present potentiality. Happily, they are not always, nor indeed most often, associated. Yet seldom, if ever, is the laryngeal affection dissociated from all pulmonary blemish. Whilst tuberculous lungs commonly do, the tuberculous larynx hardly ever does, escape that dread partnership. As it generally suffers secondarily to them, it is inevitable that the Sanatorium should sometimes harbor its latent initial stages, for we are told on the best evidence that it is often wholly unsuspected, though present. But our trespass seeks its justification from the other side of the question, that of the Sanatorial idea and of its evolution, upon which strong light can be turned from the "laryngeal quarter." Hitherto, if we may judge from the most recent contribution, Sir St. Clair Thomson's² "Three Years' Sanatorium Experience of Laryngeal Tuberculosis," that "quarter" does not yet exist, as it might.

¹ *Lancet*, May 23, 1914.

² *British Medical Journal*, December 6, 1913.

³ *Ibid.*, April 11, 1914.

and I may suggest it should, in any up-to-date Institution, such as the King Edward VII Sanatorium.

THE SANATORIUM. "One and Indivisible," were that expression not used merely as a forensic licence to point a moral, would be a libel upon a system the soul of which is individualization of the treatment to the individual, and the practice of which is so largely faithful to the precept. Strangely, nevertheless, individualization in this instance has not yet progressed to any sanatorial discrimination between the two main groups, pulmonary and laryngeal. The treatment for the one is that for the other: open air, and regulated rest, exercise, and diet—yet with one all essential addition, that of absolute or partial silence, concerning the management of which further details would have been valuable. This gives undoubted support to Sir St. Clair Thomson's main contention that what is most needed, and is found most effectual, is the Sanatorium treatment, pure and simple. It takes the worst sting from our regret that the climatic optimum should be unattainable, and also from our further regret that an artificial climate, which might be attainable in a suitable "laryngeal annexe," should not have hitherto received any practical consideration. It shows that what matters most is—in the pathology, tubercle and "its respiratory cure;" and in the local organic treatment, mainly "the function," apart from the atmosphere whether favorable or adverse. There too lies its greatest teaching, namely that, for disease, we are too apt to think last of that which should be our first thought and aim—the physiology of health. How many decades has it taken our laryngologist to discover that the one thing needful was to silence the larynx. How long, too, for our phthisiologists to realize that two things are needed; not only "rest and contemplation" for the sake of the local lesion; but, above all, "healing activity of lung and heart" for the cure of the disease. Who was the Columbus to set up that egg? Can some kind reader perhaps inform us to whom that statue of Silence is due from speech-gifted humanity?

The importance of the paper and of the results which it reviews will be gauged from its author's parallel between "then and now." Thirty-two years ago Krishaber, of Paris, announced "his firm conviction that tuberculosis of the larynx, while possibly healing in one part, yet always broke out in another, and so invariably ended fatally, generally within a year, although some cases resisted for two years." About the same time, Morrell Mackenzie wrote that "the prognosis of laryngeal phthisis is always extremely unfavorable, and it is not certain that any cases ever recover."

Many are still hopelessly possessed with those ideas of former days. On the other hand, sundry enthusiastic laryngologists, because a few surprising arrests have come their way, confidently recount the case they have actively treated and cured. Their after-histories have not

often been followed up with sanatorial completeness. Laryngeal tuberculosis is not necessarily the fatal disease it was: Progress may be looked for along certain lines. But the laryngeal lesion is still, next to meningitis, the most serious complication of phthisis. It renders the prognosis twice as gloomy as it would otherwise be; and, in the majority of cases, it is incurable if not arrested in time.

Every effort was made to admit only the early and promising cases. With a large waiting list, there is no advantage to the institution in retaining any but hopeful cases. Results were drawn from favorable material treated under the most advantageous conditions. Since January, 1911, the larynx of every patient admitted was inspected; and, when affected or even suspicious, reëxamined regularly once a month. In this way he examined the throats of 795 patients. The total number admitted was 795 (male, 466; female, 329).

Each case is placed approximately in one of the three groups of the Turban-Gerhardt classification as slight, severe, or advanced. A special local batch "Group IV" is made up of cases sent in with a provisional diagnosis of tuberculosis, in which a fuller examination fails to discover any active mischief though possibly the bearers of old, arrested, and obsolete lesions. Any such cases have been deleted from the tables and figures, which therefore deal only with manifest cases of active tuberculosis.

Taking, then, 693 cases of active and definite pulmonary tuberculosis, the larynx was affected in 178, or 25.6 per cent., a strikingly high proportion.

The Frequency in the Sexes Comes as a Surprise. 24.0 per cent. in the males, 28.3 per cent. in the females, contrary to the commonly accepted estimates. Morrell Mackenzie gives the proportion in out-patients as 2.7 males for 1 female; and postmortem records of ten years at the Brompton Hospital, 28.85 per cent. of females and in 56.27 per cent. of males. That prevalence had commonly been attributed to a greater liability of males to throat affections generally, from their more frequent abuse of tobacco and alcohol, and exposure to dust in workshops, mines, and factories. But the sanatorial cases here registered, both male and female, do not come from the industrial classes; and both sexes live under very similar conditions. This may account for the figures being so approximate, and tends to show that, under similar conditions, the incidence of laryngeal tuberculosis is much the same for both sexes. Women come more readily to a sanatorium than the male bread-winner, partly too because their various forms of poor health are more apt to simulate tuberculosis. The surplus of female cases in other statistics would have gone to reduce the percentage of laryngeal cases, and to swell the number of cures. This may explain why, at Midhurst, laryngeal disease is as common with women as with men.

The percentage of incidence at various stages works out at 13.7 for Group I, at 27.1 for Group II; and at 40.8 for Group III. The only novel fact is the high proportion of laryngeal affection "in quite early cases." This is a momentous statistical complication. It disqualifies those cases for Group I: they drop into Group II. Therefore in order to compare laryngeal and non-laryngeal cases, we must add Groups I and II together, as the more favorable cases, *versus* the less favorable ones in Group III.

The Mortality works out thus:

	Surviving. Per cent.	Dead. Per cent.
All cases (178):		
Larynx normal	73.5	26.5
Larynx diseased	49.1	50.9
Favorable cases:		
Larynx normal	84.4	15.6
Larynx diseased	66.6	33.3
Unfavorable cases:		
Larynx normal	46.9	53.0
Larynx diseased	29.6	70.8

The Results of Treatment.—The bearing of these statistics upon prognosis is unequivocal, and not cheerful. Happily, the results of early treatment are more encouraging. The total percentages are:

Arrested	20.78 per cent.	Improved	34.83 per cent.
<i>Statu quo</i>	34.83 per cent.	Worse	9.55 per cent.

Thus 99, or more than half, were either improved or completely arrested during their three months' stay. But the remaining 79 were not likely to do well.

The arrest was *spontaneous* in 22 instances, without any direct treatment, other than silence, in addition to the usual Sanatorium routine. In 15 cases, cicatrization was hastened by *galvano-cautery* (applied in all to 36 cases).

Tuberculin was used in a good many cases. In 2 or 3 instances only, some improvement was noticed. Further *surgical interference* was only twice needed; and *local palliative* treatment was seldom resorted to.

This is all we hear of the details of treatment from the author. He does not refer to the functional respiratory cure, nor to the humming cure, some account of which is included in the chapter on "Sanatorium methods" in my work on "Early Apex Treatment, and Artificial Pneumothorax," shortly to be published.

To sum up the author's guarded conclusions: (1) *laryngeal tuberculosis* occurred in 25.6 per cent. of the selected cases admitted from the middle classes; with an almost even sexual incidence (female, 28.3; male, 24 per cent.); and with a greater early stage incidence than previously estimated (in Group I, 13.7 per cent.). In Group II that

proportion was doubled (27.4 per cent.), in Group III it was trebled (40.8 per cent.). As 102 of the total admissions (795) presented no signs of active laryngeal disease, their inclusion into Group I would have obscured the main statistical conclusion at first stated above; (2) the *prognosis* is more decidedly and heavily aggravated by the laryngeal complication than hitherto assumed; (3) as this not infrequently fails to elicit any complaint of discomfort or any change in the voice, it should be carefully looked for in all cases; (4) *improvement* in lung and larynx frequently, but not necessarily, progresses *passu*. In certain cases the larynx improves, while the lung retrogrades. The converse rarely takes place; (5) *arrest* of laryngeal tuberculosis can be effected in a sanatorium in 20.7 per cent. of all cases. Limited and slight laryngeal lesions, particularly in Groups I and II, may become arrested spontaneously with sanatorium treatment; (6) *galvanocautery* is the best weapon we have at present for local treatment. It was only indicated in 20.22 per cent. of 178 cases, and it completed the cure in 41.60 per cent. of the cases in which it was employed. Like satisfactory results have not, so far as known, been secured by any methods outside a sanatorium. Finally, *sanatorium treatment* is at present the first and most valuable method we have for arresting laryngeal tuberculosis, as local measures are much more promising under sanatorium conditions. At present, in many cases, the diagnosis of tuberculosis is too long delayed, or the patient is sent to a sanatorium much too late to effect a cure. With our present therapeutic resources, to get better results, we must urge the importance of early diagnosis, and then prompt sanatorium treatment.

Camac Wilkinson¹ has submitted both the statistics and the conclusions from them to a sharp criticism. He says: "If the figures are right, then tuberculin is a marvellous remedy for arresting and preventing the development of laryngeal tuberculosis: because, during a period of fifteen years, I saw but one instance in which laryngeal tuberculosis developed during tuberculin treatment, and in that case the tuberculous ulcer healed completely before the end of treatment; and in a period of more than twenty years I have only had four instances in which laryngeal tuberculosis developed after treatment with tuberculin had begun. During this period I have treated several hundred cases. No such record has been claimed in laryngeal tuberculosis."

Bruschettini's Vaccine for Tuberculosis, the result of ten years' trial with different vaccines and serums, is confidently recommended by him as efficacious and harmless.² The material which he uses is the pleural exudate of rabbits, obtained from them sometime after the injection of living bacilli in uniform suspension in a physiological solution, their pleura having been previously treated with injections inducing

¹ British Medical Journal, April 18, 1914.

² Riforma medica, February 21, 1914.

a considerable intrapleural leukocytosis. The result is an exudation containing a vast number of leukocytes charged with jelly-stained bacilli and a few free bacilli well stained. This is pounded in a mortar with sterilized quartz and emulsionized with dilute oxygenated water and 0.8 per cent. salt. The emulsion is shaken up for twenty to twenty-four hours with the addition of a few drops of chloroform and filtered through a thick layer of cotton wool. With this vaccine the author got surprisingly good results; and he quotes some extreme cases which recovered under his treatment. As to the number of injections required, no general rule can be laid down. At the outset one injection every five or six days may suffice; but more may be necessary if prompt relief does not occur. No bad results were recorded nor any alarming reaction.

Pulmonary Silicosis. An exhaustive report is furnished by Watkins-Pitchford¹ on the prevalence, the prophylaxis, and the pathology of the disease among the miners of South Africa. He believes that a scrupulous obedience to the present regulations, by excluding the bacillary sputum from the workings and compounds, would lead to the suppression of the phthisis which is grafted upon the mineralized lung, and to the more efficient protection of the latter from the silicious evil. The dust acts not by ingestion, but by inhalation. It is so fine as to defy all mechanical arrest by respirators, etc; the only remedy being to keep the men away from it until it has settled. After death, the lung does not collapse, owing partly to the interstitial fibrosis and partly to adhesions. Its examination should be made with the help of the polariscope.

The Medical Treatment of Tuberculosis. Our cursory review need not include minor agents of old date, such as guaiacol, camphor, etc., but only the most recent, and among them the most effective is *iodine*. The medicinal question, as it stands, might almost have been summed up from our latest treatises as "hardly worth discussing except in connection with intercurrent symptoms." *A priori* that uncompromising attitude, excusable thirty years ago under the greatest of our doctrinal oscillations (all of which in the past have been reversed), is least defensible as addressed to so unlimited a field for reaserch at the time when it is at last offered by our modern experimental pharmacology its first opportunity for genuine scientific study. But the medicinal idea is difficult to eradicate. It has never quite ceased to yield isolated instinctive individual outcrops bearing some definite, if fractional, value, by the side of the more favored line of bacteriological study. Those results constitute a sufficient *a posteriori* plea for inquiry. Yet none of these remedies, any more than tuberculin, have made good their claim to be indispensable. A further plea lies in the essential humoral analogies with tuberculin, itself typically a juice and a modifier of juices and truly a medicine for the bacillus as well as its host. But

¹ South African Medical Record, February 14, 1914.

the strongest of all is that of the curative analogies from collateral clinical fields—from the success of mineral and of vegetable drugs in other parasitical affections, and, to mention only the latest, of *salsarsan* and of *emetine*. All this is hinted or expressed in Sir William Whitla's¹ masterly oration on "The Trend of Thought in Recent Pharmacological Research." Bacteriological study has brought us back to the deeper study of drugs and of their biochemical reactions which are indistinguishable from those of toxins, enzymes, and hormones, and to Ehrlich's *Therapia Sterilisans Magna*, or chemotherapy, built up by the work of Binz and of Brown and Fraser. Among the latest results of those of Morgenroth, described by Wright "as destined to stand out as a landmark in the history of pharmacotherapy, because they furnish the first demonstration of the possibility of preventing and of curing a bacterial—as distinguished from a protozoal or spirochetal—infection, by the administration of a drug" (*viz.*, ethylhydrocuprein hydrochlorate). We are led to the thought that life is chemistry, since life is movement and chemistry the movement of atoms. The practical conclusion is that we cannot afford to neglect the "medicinal aspect of phthisiotherapy any more than the "mechanical."

THE INTENSIVE IODINE TREATMENT OF PHTHISIS links up the past with the present, and not improbably with the future. L. Boudreau² emphatically advocates a systematic trial of iodine, pushed to the extreme limit of tolerance, on the strength of his own clinical experience of it for ten years in the treatment of pulmonary, as well as in some other forms of tuberculosis. If, as he states, it is a direct, and, when used heroically, in effect a specific agent, modifying our organic reactions in a degree practically amounting to immunization, we have all the time been missing its best opportunities whilst playing with the minor efficacies of its superficial applications, to the skin with the brush and to the mucous membrane from the inhaler. We have failed to perceive from our empirical use of cod-liver oil and of *spongium ustum*, or from our iodine inunctions for scrofula, that greater things might be realizable above the range of any such attenuations. The wide scope of its healing action almost indicates that iodine is not merely a many-sided antidote for various poisons, but that it acts irrespective of their individual peculiarities; in short that, like oxygen, it is a specific not for the poisons, but for the living organism, in its fight for safety against them. That broad inference takes some solid shape in our knowledge that, at the higher end of the scale of life, *Thyroides usta* also contains its iodine. Our recent insight into the regulating mechanisms of complex organisms enables us now to draw therapeutical inferences which are far-reaching. The first is that our summary dismissal of cod-liver oil, and of all drugs,

¹British Medical Journal, May 31, 1913.

²Jour. de méd. de Bordeaux, January 4, 1914.

was ill-considered. In the second place, we may once more believe in the action of many drugs. But we have henceforth a standard of excellence for them, to save us from wasting study and time upon their multiplicity. The mechanism of cure is a unit, and the preëxcellent drugs which suit its simplicity can only be few. We shall know them, like oxygen, by their harmonic efficiency.

The most specious objection had been the dread of that solvent action, likewise probably phagocytic, which is one of the greatest virtues of iodine: a fear that by mobilizing the germs along the bronchial tract, as evidenced by increased crepitations, broadcast infection might follow. In my own case, this amounted to an inconsistency. Since I had not failed to attribute the striking success of potassium iodide in pneumonia to its production of abundant rales (as denoting a rapid liquefaction of the fibrin), and to its transformation of the hyaline viscid sputum into a relatively abundant mucopurulent one,—nor to instance the absorption of gummas as necessarily bound up with a like mobilization of the infection. After all, it might be best to increase the rales if our bacilli can be mobilized out of the system. It might be well to exercise the lungs instead of resting them if increased respiration, expectoration, and cough are their only way out. Perhaps then an exaggerated dread of auto-inoculations may also have had its day.

Iodine seems to be unique in combining relative harmlessness with a range of beneficent actions, the extent of which had not been realized until the intensive method had been successfully resorted to in phthisis and in tuberculosis by Boudreau, and by Curle and Reeve. It is to the iodine that the iodides owe their efficacy in pneumonia, in syphilis, in adenopathies, etc. They, too, are capable of intensive administration, but they lack some of its virtues; and they have toxic tendencies of their own (particularly KI), which depress the cardiovascular and nervous systems instead of stimulating them: whilst that stimulation is a leading feature of iodine, and its only obvious effect upon the delicate nervous structures and functions. For that reason, as well as for dread of their greater hydrating effect upon the mucous membrane, we had systematically shunned them in phthisis. Above all they lack its volatility, which explains so much. In spite of its extensive use as an inhalant, we had missed the greater opportunity of its continuous volatilization all the way down the alimentary tract. This seems to be the practical feature in Boudreau's method by means of the strong French tincture, as its iodine is almost entirely precipitated in the glass by the water or varied beverages which have to be added to the dose.

Iodine in Metabolism and Therapeutics. Boudreau's demonstration of what iodine can do *per se* for a ruined nutrition in advanced phthisis, happened to coincide with the belated recognition by surgeons of its preëminence as a germicide. Previously secondary in its acknowledged

versatility to oxygen our universal "medicine of health" endowed with so much less of a control over disease, that double revelation seems almost to foretell for iodine a therapeutical primacy, either as a principal or as an adjunct, in the future treatment of many affections; and to promise for its metabolic asset, a wider field in an "indirect therapy" than that hitherto served by its direct activities.

Most of our potent remedies are poisons; and their benefits subtoxic. Yet, by some strange euphemism, their virulent effects have been labelled "physiological." The distinction of that title has been more legitimately extended to NaCl. It might almost be claimed for iodine on similar grounds. Chlorine, though toxic when free, is physiologically indispensable in its sodic combination. Iodine, facultative as a remedy, is relatively non-toxic, and in that sense physiological; much more so, however, *quâ* integral to our structure and functions. On a smaller scale than in some forms of ocean life, it is part of our metabolism; though most prominent in its regulation. Deadly only to microbes and vegetal parasites, it has proved to be, in its highest doses, not only harmless but beneficial, and in a wide sense harmonic to their host.

As regards its direct activities, in addition to those we have enumerated, Boudreau gives special prominence to its vitilizing effect upon the leukocytes and phagocytes, without any apparent detriment to the respiratory cells. Might we not then extend that statement to the blood itself as the real centre of the lymphatic function, of its ubiquitous cellular activities, of their mechanical metabolism, and therefore of the mechanical energies of life. Although our knowledge of the conservative action of iodine upon cells dates back to Virchow's cellular pathology, and has been constantly used by histologists, it had not yet been productive of any practical suggestion for its therapeutical application. All this would be summed up in the feature which Boudreau claims as characteristic of free iodine in contrast with its salts, namely, that it is essentially a tonic and stimulant for living tissues. We might add, too, that it does not seem to be in any degree an intoxicant to the most delicate of them, the nervous.

For some of the severe blood affections, von Koranyi (1912) has sought a remedy in *benzol*, which had been identified by Selling as a blood poison (1910). Can we thoroughly trust a blood cell destroyed to give us better blood? Yet Barker¹ reviews it favorably for leukemia, and J. S. McLester² likewise for polycythemia. While decimating the cells, it attacks the bone marrow. Systematic small bloodlets coupled with transfusions might be less drastic to the cells, and a harmless physiological stimulus to the marrow. Until we have exhausted nature's storehouse, there is less excuse for the risks of our artificial carbon compounds. They were once expected to suppress pneumonia by

¹ Johns Hopkins Hospital Bulletin, 1913, p. 363.

² Jour. Amer. Med. Assoc., May 2, 1914.

levelling the temperature chart; but in the end we have turned to iodine to do both effectually.

The internal use of free iodine having remained limited to the minimal pharmacopœial doses of our tincture (2.5 per cent. of I, with equal parts of KI), and to inhalations of its vapor, iodine medication has been exclusively represented by the mineral iodides, particularly potassium iodide, in their small, moderate, and sometimes, as in syphilis or aneurysm, heroic administrations. The fact that *iodism* is more apt to result from the smaller doses, and may be avoided and can even be relieved by taking larger ones, has been attributed to their partial conversion into iodates. On that basis, David Curle,¹ of Glasgow, has recently evolved a chemical explanation. They have already had their intensive trial, and they have stood it without any major toxic effects; whilst iodine, which had never itself been submitted to that test, has been held ultimately responsible for the iodism. The other minor toxic effects of iodides, noticed in some individuals much more than in others, those of a general depression, chiefly cardiovascular and partly perhaps nervous, have been attributed to a like origin, although no clinical proof of it has been attempted. As an *a priori* against that view, the salt of sodium, a lighter metal than potassium, binding a larger weight of iodine under the same dosage, is known to be much less depressing, and, according to Boudreau, also less productive of iodism.

In addition to those salts, we have recently been supplied with organic combinations, for instance *iodoglidine*, as albuminates from which, it is claimed, iodine may be liberated by the alkaline digestion in the intestine. On that assumption they would provide us with a direct internal iodine medication, under an indirect form of administration. The main question would then have to be studied under three conditions: (1) the indirect administration of iodine in its metallic salts, which still leaves us in doubt; (2) its indirect administration in organic combination, which is still *sub judice* as to the nature and the quantity of any internal supply of iodine; and (3) the direct administration of the metal uncombined, in larger doses than heretofore. This is the "Intensive Iodine Treatment" of L. Boudreau.² I have recently ventured to apply to it, for better identification, the name "metallix," when suggesting its wider trial in arthritic affections.

Boudreau's Intensive Method begins with very small, but progressive, doses of the tincture of the French Codex of 1908 (1 part iodine, in 10 parts of 90° alcohol). These are taken at varied intervals throughout the day, added to various beverages to mask the taste of the iodine which is "unpleasant only in plain water." He pushes the daily dose to the utmost limits of the individual toleration, the maximum dose

¹ Practitioner, December, 1912.

² British Medical Journal, May 15, 1914.

being then continued for weeks or months. Far from showing any repugnance, the patients are eager to increase the dose. A total of 400 drops daily was maintained by one patient for a whole summer; another persevered with a dose of 350 drops without any inconvenience. More commonly the dosage is up to 200, or more, drops daily. Children of six or seven years usually tolerate 40 to 60 drops. Symptoms of iodism are exceptional, or so trifling as "to be disregarded."

On that plan, Boudreau believes that the well-known "bactericidal" powers of iodine can be brought into actual operation; while, according to his clinical and laboratory observations, the opposite effect is exerted upon the polymorphs and the phagocytes, which continue to thrive under increasing doses. This would identify iodine as a remedy, not for pulmonary tubercle alone, but for tuberculosis itself in any form. In that connection he withholds some important evidence for further testing and future publication. His results, however, have been sufficiently striking to make him urge that "tubercular meningitis" should be immediately treated on those lines; and that on no account should "renal tuberculosis" be submitted to operation before the patient has undergone a thorough course of iodine.

Boudreau makes due allowance for idiosyncrasy and for the individual factor. He does not set up the claim that the cure is infallible, or to be regarded as universally applicable. In that connection, it is worth noting that he has sometimes found the slighter forms of pulmonary disease most refractory, and the severe cases more amenable. For the long delay in the publication of his method he offers the excuse that the importance of its purpose and that of its results both claimed to be supported by unassailable evidence, and its clinical success to be confirmed by the test of time.

To revert to Boudreau, he does not profess that it is by any means invariably successful either in early or in advanced phthisis, nor that his method is universally applicable, but he contends that it is worth trying in all forms of tuberculosis, and in most cases of the pulmonary affection. Its first feature is an almost invariable absence of any appreciable iodism or other toxic symptoms, which allows its use, sometimes with surprising benefit, in far advanced and incurable stages. The second feature is the likewise almost invariably favorable subjective testimony from patients as to their increasing fitness and strength.

The objective evidence is that of a steady progress in all the clinical signs and symptoms; in the sputum, as regards its quantity and quality, and its bacillary content, which always diminishes and often disappears; in the appetite, digestion, and assimilation; and in the body weight. His results have been: In early phthisis, a cure which has been permanent; he does not mention any relapses; and in late cases, often considerable improvement, but practically always some degree of alleviation, with increased euphoria. In other forms of tuberculosis his

varied experience has been very encouraging, with the single exception of severe lupus.

Under these reservations which apply to all solitary clinical investigations, Boudreau's advocacy possesses strong claims to consideration in the unusually long duration of that clinical trial, and in his ample opportunities for watching its after-results. Any more recent methods are at a relative disadvantage in the shorter period of their probation; and it would be premature to attempt any comparative estimate. But the nascent iodine method has already reached the stage of collective investigation, in advance of Boudreau's. In reality the immediate question before us is not as to which of these or other methods may prove to be the most practical and profitable, nor as to their relative suitability, potency, and success under varying conditions, but as to the therapeutical merits of iodine, and those of its intensive administration.

On both those main issues, practical conclusions have been materially forwarded by the close coincidence in time, and by the remarkable coincidence in results as regards phthisis, between the two leading methods. They are mutually confirmatory in their striking differences, which give prominence to their common factor. The favorable results recently obtained by Curle, by Reeve and by others, confer upon Boudreau's published experience an importance which it could not otherwise have claimed. Both methods are now available, and it is much to be desired that their separate trial should be conducted to a finish. Although it is manifest that the "metallic" plan is more simple and less trying, and that it is free from any depression, discomfort, or distressing symptoms, it has already given us, for tuberculosis, the greater part of its promise.

THE TREATMENT OF PHTHISIS BY INTENSIVE NASCENT IODINE. An entirely new principle, full of unknown possibilities, has been introduced, for our internal iodine therapy, by David Curle, of Glasgow, in his pioneer paper in the *Practitioner* for December, 1912. This has since been put by E. G. Reeve,¹ of London, to an extensive clinical trial, with equally telling success. Its starting-point was the employment, in phthisis, of the transcutaneous or electric ionization method. Its latest development by Curle has been to combine that external method with the internal, and thereby to localize the operation of the chemical or nascent iodine to the actual seat of the disease within the thorax. His method is based upon a chemical study, best suited for perusal in his original paper, of the reciprocal reactions between iodine and its salts, particularly potassium iodide. The main point is that potassium iodide, in solution, binds to itself definite charges of iodine in excess of its own formula. A relative saturation with potassium

¹ *Practitioner*, September, 1913.

iodide is thus the means of obviating iodism, as this is due to the liberation of iodine. In that way (while the smaller dose, being completely split up, evolves free iodine, the unsplit remainder of a larger dose may avail to hold it fast).

Given a liberal supply of potassium iodide in the morning (30 grains, but Reeve finds that 20 suffice) and allowing an interval of four hours for its distribution, and for its complicated preliminary internal chemical reactions, it is possible by successive two-hourly ounce doses (taken in fresh lemonade) of a specially prepared solution of chlorine, to liberate definite successive amounts of iodine in the tissues, with the formation of KCl which has the advantage of being a powerful heart tonic. The original addition of potassium bicarbonate to the dose of potassium iodide has been discarded by Curle, in view of the quicker results obtained by Reeve without it. He has also limited the original two-hourly administration of 30 grains of sodium bicarbonate to the indication of threatening iodism. He has also adopted the lemonade, as suggested by Reeve, for its antiscorbutic and other advantages, and because it tends to retard the recombination of the free iodine into alkaline iodide in the blood.

The regulation of the intensity of the treatment, therefore, rests with the amount of chlorine. Only three doses are administered at first. After three weeks they may be increased to four, and later to five, without further ill effects. The initial symptoms of head-cold, and often severe headache, which appear toward midnight and are usually relieved by the morning dose of potassium iodide, cease to recur after four or five days. The burning sensation in the esophagus from the chlorine also passes off after a time. Severe iodism with edema (and, in one case, a rash) was only met with by Reeve in two advanced cases with albuminuria (lardaceous), and attributed by him to an increased rate of potassium iodide excretion, leaving too little of it to bind the iodine. The tendency to vomit the chlorine was controlled by sparing its administration from the meals, in particular in a case of gastric ulcer which improved greatly.

It is apparent that the treatment is severe and unpleasant. On the other hand, its efficacy is amply demonstrated (1) by the pyrexial rise induced after a few days for varying periods, indicative of focal reactions on a large scale; and (2) by remarkable changes in the sputum. This becomes easier, with less cough, and ultimately diminishes with either partial or total disappearance of tubercle bacilli. The organisms of mixed infection are the first to disappear; whilst the tubercle bacilli show early loss of acid-fastness, and splitting, without usually any obvious increase in phagocytosis, though in a few cases of rapid improvement all the bacilli were found within the cells. In the blood, too, Black's findings¹ would prove that the treatment has a specific action.

¹ Journal Clinical Research, vol. vi, No. 2.

and does not act merely by raising the phagocytosis in the blood. Reeve lays stress upon the diagnostic and prognostic importance of keeping count of the polymorphoneutrophile nuclei. The sputum was tubercle-free after three months' treatment in 33 per cent. of the cases.

The more remarkable sputum changes are described by Reeve, as follows: "In old cases in which the disease had been present for many years, it was markedly caseous, the lumps being as large as marbles and of the consistency of dough. At first it is slightly increased, and then shows breaking up. Around the periphery of each lump, there appears a fringe of mucus of a sky-blue tint. This gradually spreads into the centre, until the whole of the caseous material disappears. About the third week, in a large number of cases, the caseous lumps became stained with altered blood around the periphery." This he took to indicate a marked inflammatory reaction around the infected foci. After three to four days the blood disappeared. The sputum became steadily more mucous, and decreased in quantity, in most cases amounting to only one dram in twenty-four hours. Hemoptysis occurred in nine cases; but Reeve found no ill effect from continuing the treatment, on Curle's assumption that the potassium iodide content of the blood tends to lower its pressure.

The Physical Signs have afforded Reeve, Halls Dally, and others who are practising Curle's method, evidence corroborative of the thermometric record, as to an initial widespread focal reaction. This is in agreement with all previous reports from tentative administrations of the iodide in phthisis. The tendency to an increase in the moist sounds, which had been interpreted as a warning against the latter, is in reality a first step toward healing. In acute pneumonia, whenever treated with the iodide, this is clearly in all cases the mechanism of the much more rapid and obvious resolution. The liquefaction of the acute fibrinous consolidation is aided by the ubiquitous hydration of a mild bronchial catarrh, which quickly substitutes rales for fine crepitations, and mucopus for hyaline mucus; aborting, or resolving, as the case may be, the pneumonic consolidation within a few hours in favorable cases.

That process is of great localizing diagnostic value in early phthisis; where any latent foci, percussed for in vain, are apt to be then revealed. It is likewise witnessed in the dreaded local reactions of auto-inoculation. There is, however, the essential difference that in them the mobilization of bacilli is not met by any powerful germicidal agent. The curative value of that factitious bronchitis is sufficiently declared by its rapid disappearance. It bears significant indirect testimony to our contention for a policy of apical respiratory activity instead of stagnation, which should invite, at the earliest stage of infection, rather than suppress, the physical signs of auto-inoculation. The curative reserves which we now possess in iodine and in pneumothorax radically modify the

therapeutical outlook. They set at rest the misgivings which were formerly felt as to our gratuitously despoiling the patient of his chances of ultimate recovery.

THE INFLUENCE OF FREE IODINE UPON PATHOLOGICAL METABOLISM is a promising but difficult task for future research. The metabolic results of the iodine treatment are complicated in the Curle method, but not so in Boudreau's by the divergent influences which are special to the iodide, as well as by a much more searching medicinal ordeal. Yet, in the end both methods present us with the same mysterious contrast—that intensive iodine, which is systematically thinning for obesity, is fattening for phthisis. This raises wide speculations as to its therapeutical mechanism. Is iodine perhaps more largely "directive" than chemically active for the organism, whilst directly biochemical in its action upon microorganisms? The hormonal value, for the nervous system, for the blood-regulating glands, and for our effective and essentially dynamic protoplasmic blood work, is retarded in Curle's method by an inevitable initial depression. In the metallic method, it is the first to be manifested clinically in the striking tonic rebound of the leading functions. If iodine could be identified experimentally as the genuine cause of that general stimulation, we might conceive of its being perhaps equally capable both of raising a languid tissue assimilation and of hastening any defective tissue catabolism, mainly through its nutritive control over the mechanical agents immediately concerned in both those processes, our varied leukocytic contingents.

In more general terms, iodine is typical and unique among "alteratives," in the extent of its non-toxic range, which is much greater, for instance, than that of mercury or arsenic, and therefore available on a much larger scale; and also by its extraordinary adaptiveness for righting the balance of metabolism, on whichever side this may chance to drag. In that balancing action it is most akin to, and conceivably might coöperate with, our regulatory glandular function, as, for instance, in the regulation of blood-pressure which it seems to lower in hyperpiesis, and raise in phthisis.

The regulatory glands are themselves dependent for efficiency upon food and nutrition. Their response might be merely their own *pro rata* share of a general nutritive protoplasmic advantage; and Boudreau might be literally right when he claims for iodine a direct modifying power over the temperament, *i. e.*, our constitutional metabolism. This still leaves us free to discuss a more limited aspect, that (for which he suggests the name "indirect opotherapy") of feeding iodine to the glands. For that purpose why pile up so great a store of it? How little iodine might suffice to feed and stimulate a lazy thyroid or pituitary. However that may be, we can at least interview some plausible explanation for the mystery of the alternative blood-pressure events. In tuberculosis, Boudreau at once raises the pressure. Curle depresses

it at first; but the tonic influence of the iodine ultimately prevails over the depression from the iodide.

On the "protoplasmic" basis which I have suggested for mere theory, it is apparent that our "facultative" iodine touches all health and disease, in some analogy with the chlorine in our common salt. Chlorine, however, is "imperative," if alone for gastric reasons, though that would be too limited an attribution. It would follow that practically we shall have to try iodine not only in our severe *Anemias* referred to above, but in all diseases, whether parasitic, or metabolic, or both in combination. First of all then in *cancer*, as a double chance of striking at the cause; though perhaps only as an auxiliary in subduing the riot of bastard cell-growth. It has long been held and urged by A. Theilhaber¹ that for neoplasms, quite apart from the possibility of their humoral origin, great importance must attach to improving the blood and the blood-producing organs, and also to improving the circulation within the growth. That conclusion now gets its experimental support from the latest development of Alexis Carrel's Rockefeller researches on transplantations, in James B. Murphy's² brilliant results in the heteroplastic transplantation of tumors. Rat tumors grow rapidly when grafted upon chick embryos: they, however, always disappear at a later stage of the animal's growth. But whenever, in addition, adult chickens' spleen and bone-marrow had also been grafted, these grew actively, but the tumor did not grow at all. Those experiments and others are summed up by Carrel as a discovery that the power of the organism to eliminate foreign tissue is due to organs such as the spleen and bone-marrow; and that, when these are less active, a foreign tissue graft can develop rapidly without any check.

In the next place iodine should be tried in *arteriosclerosis*, which hitherto has been treated only with the iodide, and half-heartedly only. Years ago I used the latter heroically for aortic aneurysm, on the intensive plan, in conjunction with a dehydration, still more heroic, by total suppression of fluids in the dietary. My object was not the formation of fibrin within the sac, which iodine could only discourage, but the absorption of unhealthy fibrin from its walls, as a first instalment towards healthy repair; rightly as it now proves, yet imperfectly *quâ* the means then selected. That nutritive object prevails unconditionally in arteriosclerosis, the arterial wall needing only, at first, to be disencumbered; and it clearly transcends our clinical blood-pressure considerations. That same object prevails much more in the denutrition of non-vascular tissues; in the degenerating cartilages of *Rheumatoid arthritis*; and in the *Ocular Opacities* due to malnutrition of the cornea, of the vitreous body, and, above all, of the lens.

¹ Wien. klin. Woch., March 5, 1914.

² New York Medical Journal, April 25, 1914.

The Nervous system, thanks to its tolerance for the remedy, is likely to be susceptible of benefit in some of its disorders. But of all other affections, on merely statistical grounds of their relative prevalence, gout and rheumatism, our tensive and our hypotensive "Delayed Metabolisms," for which the iodide is an old and trusted remedy, though we may have given too little of it, can plead far and away a first claim to the clinical trial of iodine. As a special objective *Rheumatoid Arthritis* has been denied it, whilst probably needing it most; for, it appeals to the tonic powers of iodine, in contrast with those of its more toxic potassium salt, as a "misère physiologique" not unlike that of phthisis in its record of depression as a cause and a result.

For *Rheumatic Fever*, although its latest therapeutics still omit any mention of that medication, I had long taught that in all cases, but above all in the young, the first essential, and the one thing needful for the heart which we should never neglect, is the "immediate and continued" prophylactic administration of the iodide. Iodine may yet prove to be a better prescription.

Not alone here, but in each of the quests we have pursued with the iodides, we shall not know how much more might perhaps be achieved, till we have revised our entire experience, and tested the virtues in the prime agent to their utmost, by administering it not only down the obscure paths of digestive absorption, but also along its own appointed route—the most direct and rapid, and the only one free from any road-side metabolism—from the alveoli into the arterial blood by systematic inhalation.

But, of all other urgent pleas for help, none can compare with that still urged in vain by the septic affections *par excellence*, *Septicemia* and *Vegetative* and *Malignant Endocarditis*. For that trial it might be possible to devise some convenient form of systematic inhalation as a substitute for; or an adjunct to, internal administration, to suit the gravity of the clinical conditions.

A note may be added in relation to the "*Thomassen*" *Treatment of Actinomyces* by *Potassium Iodide*. This had failed at first in the case of a girl of fifteen, with edematous lesions of five months' standing in the left inframaxillary region, under the care of Pinoy.¹ In spite of the daily dose of 100 grains, the disease progressed; until at last the lesions were galvanopunctured, and a *salt-free diet* was ordered with a view to control the facial edema (March 27). From that date she began to improve and was discharged cured in August. Pinoy attributes that success largely to the salt-free diet which she was able to maintain, thanks to his happy suggestion that she should flavor her dishes with "the Iodide instead of Salt."

¹ *Annals of Dermatology and Syphilology*, October, 1913.

PHYSICAL EXAMINATION.

Palpation. *Special Technique in Palpation.* L. Napoleon Boston¹ provides us with a variety of useful practical hints in abdominal, as well as thoracic, palpation, which should be read in the original, where they are well explained and illustrated. A specially important point is insisted upon; the *bimanual use of the index finger* as the most reliable basis for any comparative palpatory examinations.



FIG. 1. Determining the exact boundary of an area of pulmonary consolidation through the degree of vocal tactile fremitus. The left index finger recorded far more fremitus than did the right.

LOCALIZING SUBPHRENIC PALPATION is too much neglected, according to T. Hausmann² in favor of *x-ray* examinations which are often unnecessary. By combining his "sliding" and his "deep" palpation, he was able to determine the greater curvature in 45 per cent. of subjects examined, the normal pyloric antrum in 25 per cent., the transverse colon in 60 per cent. in addition to the more easily accessible organ and tumors of the lower abdomen.

¹ New York Medical Journal, November 1, 1913.

² Arch. f. klin. Chir., 1914, vol. ciii.

MEDIATE PALPATION is used successfully and with great satisfaction for abdominal work by A. Campani.¹ The right hand, lying passively upon the surface, feels the result of the pressures which the left hand makes upon it.

COMPARATIVE MEASUREMENT OF THE MOVEMENTS OF THE TWO SIDES OF THE CHEST IN DISEASE. The apparatus devised by L. Napoleon Boston and Joseph F. Ulman² consists of (1) kymograph, (2) two Marey tambours, (3) metal stand, (4) two clamps, and (5) two pneumographs (modified Ellis). The pneumograph consists of a rubber tube, eight inches long, distended by a spiral spring. One end of the tube is closed, while the other end has an opening attachment to connect with rubber tubing (6) to the tambours. A bivalve (7) is interposed between each pneumograph and tambour to prevent rupture of the rubber membrane of the tambour. Changes in the air-pressure



FIG. 2. Recording movements of the two halves of the chest. Instrument in operation.

in the pneumograph is transmitted to the Marey tambours (2) which writes the respiratory movements upon the smoked paper on the drum of the kymograph (8) and produces the pneumograms (9). The pneumographs (5) are held in position by means of two small chains (11) front and back not to be drawn too tight.

In the following interesting pneumograms which are selected as illustrations from among those published in the paper, the upper tracing belongs to the right lung. The curves should be read from right to left, the opposite way to the reading of print.

In abdominal diagnosis, for which other useful hints are also given, the author has found the digital method of palpation of special value;

¹ *Gaz. d. Osp.*, 1913, vol. xxxv.

² *New York Medical Journal*, October 11, 1913.

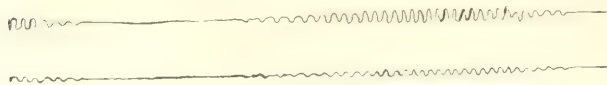


FIG. 3.—Bilateral pneumogram from a case of pneumonia—base of left lung. Cheyne-Stokes respiration present. The upper line in the pneumogram is from the right, the lower from the left lung. The beginning of the pneumogram is always on the right side of the cut.



FIG. 4.—Bilateral pneumogram from a right hemiplegic, showing decided irregularity in both respiratory curves, and appreciably more amplitude in the curves of the right side.

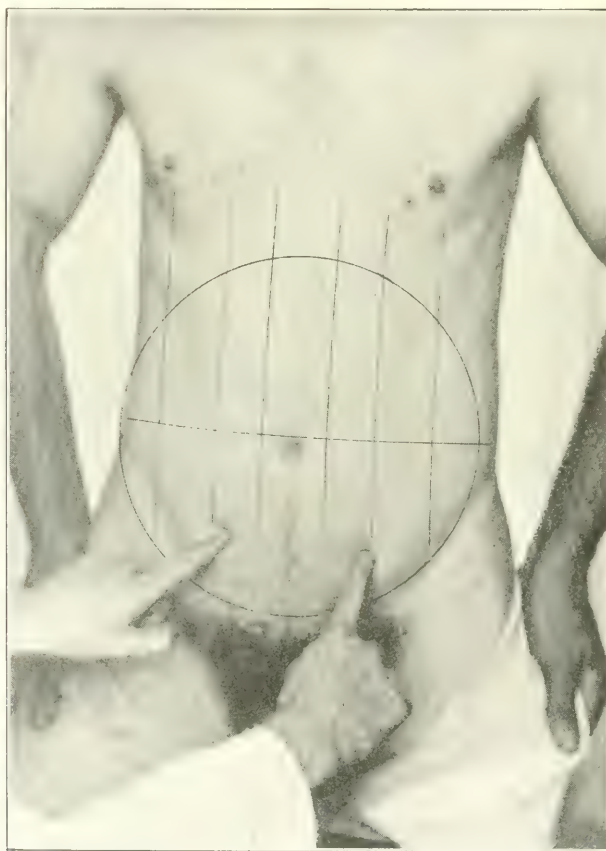


FIG. 5.—Method of determining the degree of abdominal tension.

for instance, for the detection of abnormal pulsation and of aneurysm, and for the estimation of tension.

Percussion. THE QUANTITATIVE PLEXIMETER, Gustav Baer's¹ "Perkussionsquantimeter," which he dates from Turban's Sanatorium, is well worth discussing, as it is novel in purpose and in mechanism. The figure is not quite half the size of the instrument—a thick glass rod bent at a right angle ($7\frac{1}{2}$ inches long) and provided with a vulcanite handle ($2\frac{1}{2}$ inches).

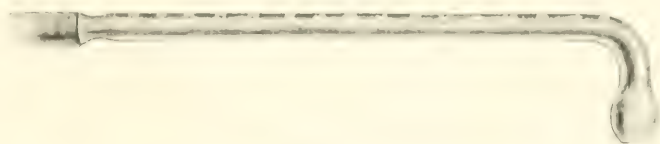


FIG. 6

The glass rod is marked in millimeters. The idea is to measure the horizontal distances from the spot percussed at which any successive strokes (of even strength) are delivered. A highly resonant note would be propagated a long way along the rod; a subresonant note only a little way. This may prove of some clinical use. But perhaps the greatest service to be expected of this invention is that it will tend to popularize the practice of pleximetric percussion. The idea of "measurement" appeals to the ordinary mind as well as to the scientific, and fastens it to the task.

In a limited trial of it, the following points have struck me: (1) The substance in this pleximeter is not homogeneous, as in Piorry's or Sansom's. Not only is the handle of different material, but the grip of the hand upon it is of considerable superficial extent. This is an additional, but by no means a uniform, dulling influence. Its variations, great, and not capable of any accurate estimation, are due to differences in the size of the hand, of the grip and in the strength of the grip. That is an "acoustic" complication. (2) A "mechanical" complication arises in connection with the transmission of the pressure from the handle to the tip along a long, angular lever. There is at first some anxiety as to whether, during the necessary modulations of the pressures, the lever might not snap; and the play of pressures may not be so free as might be desirable for efficiency. (3) Owing to these and other factors, I was not surprised to find, over any given area of homogeneous resonance such as "Traube's semicircular area," that its range of propagation varied considerably according to the different media underlying the percussions. When the pleximeter was applied to the rib, the resonance was greatly favored, and travelled far; when it was applied to the intercostal space, the resonance was much less and did not travel so

¹ Münch. med. Woch., 1913, No. 3.

far (by several divisions). That complication may possibly be overcome by practice; but it must demand additional skill in manipulation and special experience in interpretation. It does not arise in my hands with Sansom's pleximeter, which yields a uniform resonance over the entire area, as does also the finger used as a pleximeter. (4) As regards the stroke; the effective stroke pressure at the tip must vary, under any uniform strength of blow from the finger, with the distance along the lever. For strict comparative results, this detracts from the accuracy of the measurements.

For those reasons I am still in favor of: (a) a direct "vertical" pleximeter pressure; (b) a direct "vertical" stroke, and (c) complete freedom in the regulation and undulations of the pleximeter pressure, as well as in the strength of the stroke. All these conditions are provided by Sansom's pleximeter, as well as a fine tactile conduction which is probably more keenly appreciated by the fingers than by the palm. It is obviously the simpler and easier, and therefore the more reliable instrument in the hands of any average observer. Nevertheless, the fascination of the measurements is almost a sufficient recommendation for Baer's pleximeter, particularly as it might be the means of educating the pleximetric dexterity of many a clinician.



FIG. 7. Plesch's method of percussion on the hooked finger.

PERCUSSION OF THE PULMONARY APICES. The learned paper by Maurice Fishberg,¹ who has also written another important article² on "Non-tuberculous Apical Lesions," is a valiant attempt to secure for percussion the credit for a priority in discriminating power over auscultation, on the basis of the priority of the signs of condensation over those of softening. This is a logical position; but only to be won by methods and weapons of first-class precision, on the foundation of a normal topographical standard equally exacting in its accuracy. It must be confessed that our whole tuitional system fails at the base, owing largely to the diagrammatic looseness of conventional illustrations, which too often distort instead of sharpening our anatomical vision, before our touch and ear have to run the gauntlet of a bewildering

¹ New York Medical Journal, October 25, 1913.

² Ibid., 1913, vol. xeviii, pp. 14-20.

Babel of technical doctrine and procedure, "till we do not understand one another when we speak of certain physical signs." The laborious

FIG. 8

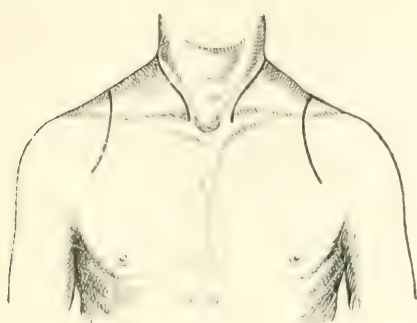
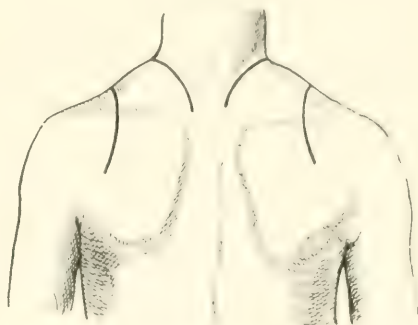


FIG. 9



FIGS. 8 and 9.—Krönig's resonant areas of the apex, anterior and posterior.

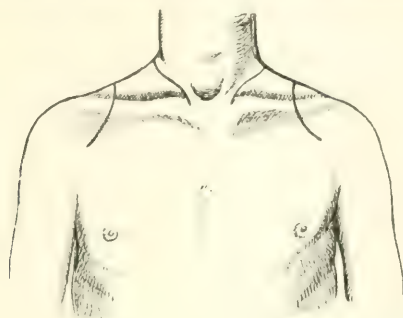


FIG. 10.—Narrowing of the apical resonant area on the left side.

FIG. 11

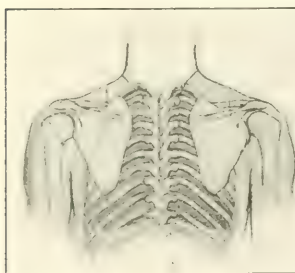
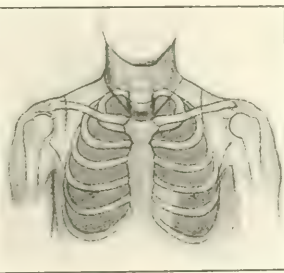


FIG. 12



FIGS. 11 and 12.—Showing that Krönig's resonant areas are not outlines of the apical margins, but are merely a projection of the same lung tissue in various directions. In the supraspinous fossæ there is no lung tissue at all. (After Goldscheider.)

superstructure is unsteady, and unreliable. Yet the matter is "physical" and answerable to physical principles, mechanisms, and results, if not

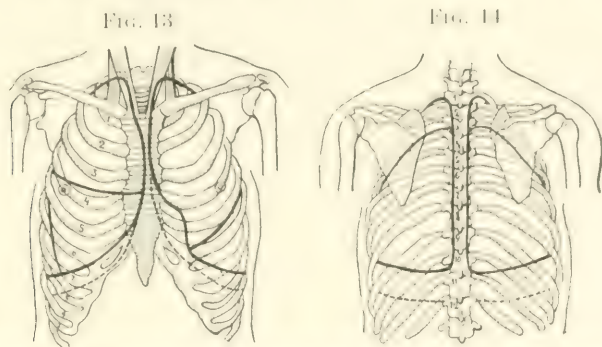
marred by inaccuracies in the handling, and the confusion multiplied by their variety. The figures are worth reproducing, as bearing out that criticism, which does not, of course, apply to true observations such as Krönig's areas, but rather to some of the misleading diagrams used for their presentation.

One of them, from Plesch, correctly illustrates an accurate method; although the still imperfectly recognized mechanism of pleximetric percussion is more easily demonstrable with an isolated, mechanical pleximeter.

The Pleximeter Principle. If we wanted to magnify any resonance we should use an "air pleximeter." But the purpose of all finer percussion is to detect, not resonances, but elusive dulnesses. Our only help is to magnify them. A suitable solid pleximeter does this, because it is a mute for any conducted resonance which might drown the shorter vibrations we have to identify as "dulness." Its individual muting power is a constant value (easily ascertainable for each pleximeter by separate percussion), which will always work true. It should obviously not be so great (as for instances that of a "water pleximeter") as to defeat our object by arresting the audible vibrations instead of merely attenuating some of them. The main point, however, is that, in addition to that essential damping effect, a good pleximeter conveniently magnifies the latent dulness into a slightly duller "chest and pleximeter" dulness. That added dulness is the relatively dull note obtained when the pleximeter is held up in the air between the fingers and percussed.

That twofold advantage provides so clear a definition that the merest tyro, or even any sound lay ears, will recognize, when they are reasonably well percussed, the true marginal outlines of organs. The study of pleximetric percussion on the cadaver, and of its convincing because demonstrable accuracy, is the bedrock of some future thorough clinical teaching. It will serve as a pattern of what efficient clinical percussion should be; and as a first lesson and warning against the snares of the unstandardized, soft, and immensely variable pleximeter of the left finger. Hitherto the pleximeter has not been vouchsafed, even to the "finishing" clinical course. It should be the initial introduction to the whole subject, and to its most difficult practical aspect, *modulated* finger percussion. Modulation is the still untaught principle, not less essential, but much more so for the left, than it is for the striking, finger. If only this could be well grasped by the student, it would matter much less if he never again were to use a pleximeter, yet what a loss that would be for a lifetime, in rapidity and clearness of definition! In conclusion, to place in its full light the tuitional necessity for organographic accuracy, here merely for its humble percussion purposes, will anyone undertake to identify the initial blemishes of a tuberculous apex, if he should find himself unable to detect in the back the presence of any dulness from pounds of solid liver, or from pounds of blood-laden

heart, or in the point where they reach the surface, to trace to a line, the precise outlines of those immense dulnesses? If possessed of that efficiency, we can fairly deal with the demarcations of a large cavity



FIGS. 13 and 14.—Margins of the lung according to Goldscheider, anterior and posterior.

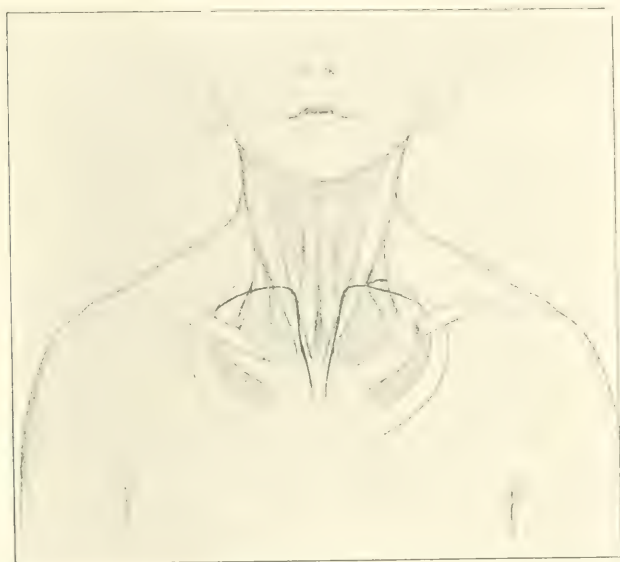


FIG. 15.—Topography of the apex according to Goldscheider. Upper and mesial borders of the lung, borders of the right rib and clavicle. On the left side the clavicular head of the sternocleidomastoid has been removed so that the scalenus anticus is visible. The upper border of the lung is somewhat higher than the first rib.

or fibrosis. But for early diagnosis we might be wasting our skill and our time over the harmless subresonances, such as that produced by some unobserved scoliosis, or nasal obstruction. Accuracy of percussion, if it should not be guided by the principles of a sound method, will

only serve to magnify those unrealities. It is a great help toward diagnosis; of itself, in its refinements, it possesses no diagnostic power.

For *earliest* diagnosis the province of percussion is not structure, but function; not, as in the dead body, the stationary peculiarities of of localities, but their active behavior; and if any abnormalities should exist, their differential interpretation, much more than their minute registration. The essence of that percussion is differentiation. It is entirely a comparative study; a comparison, to begin with, between sides; and on each side, first between its superficial inches at rest, and next between its local cubic variations under inspiration and respiration, which are hardly visible, and hardly measurable in their millimetric surface displacements by the most elaborate chest measuring machines, but revealed only to our skilful percussion. In a word, if any percussion can help us at all at that stage, it must be rather *tidal* than merely topographical; and the same applies to our auscultatory estimate of the quality of the respiratory murmur. Breath sounds are entitled to be blowing, *i.e.*, "bronchiolar" from any sort of alveolar inexpansion, whether structural or merely functional. This, for brevity, must sum up our criticism of the literature of many unsuccessful, mainly topographical, efforts, and also of some valuable achievements, such as those of Krönig and others.

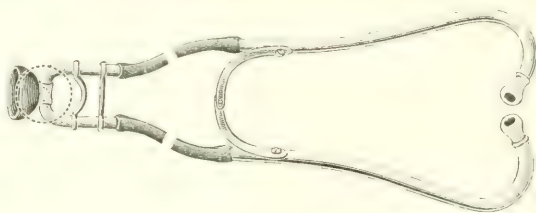


FIG. 16

Auscultation. THE ADJUSTABLE STETHOSCOPE of Gordon Copeland,¹ of Toronto, claims definite advantages for its aluminum chest-piece; for its equability of caliber throughout without any internal projections; for its angular mobility of the ear tubes; and, above all, for the hinging of the chest-piece, which affords obvious facilities. For children or emaciated chests, a "localizer" can be adapted, embodying the same principles on a smaller scale.

THE COIN SOUND, OR SIGNE DU SOU was published by Prof. Pitres, of Bordeaux (1898), as a simple means of distinguishing pleural effusion from pneumonia. While an assistant holds a coin against the part suspected and taps it with another coin, the observer listens with his ear held directly against the opposite aspect of the same side of the chest at a symmetrical spot; the other ear is stopped with the finger.

¹ British Medical Journal, December 13, 1913.

Four varieties of the sound coming through the chest have been described. The coin sign is positive when the sound heard is metallic, negative when it is dull. Pitres finds it is always metallic in pleural effusion, dull in health, still duller in pneumonia and not metallic. Those interested in the subject will find an analysis of it and a review of its literature in S. Ostrowski's¹ paper.

THE TUNING-FORK AND STETHOSCOPE IN THE ESTIMATION OF ABDOMINAL AND THORACIC VISCERA. James Cantlie² has been elaborating *de novo* and practising this method, which is neither novel nor quite recent. Although useful, it is perhaps not worth its trouble in view of the efficiency of simpler methods. He finds that, for general purposes, the best pitch is "G-sharp." The tuning fork can be fitted with a hammer for convenience; but this is not indispensable.

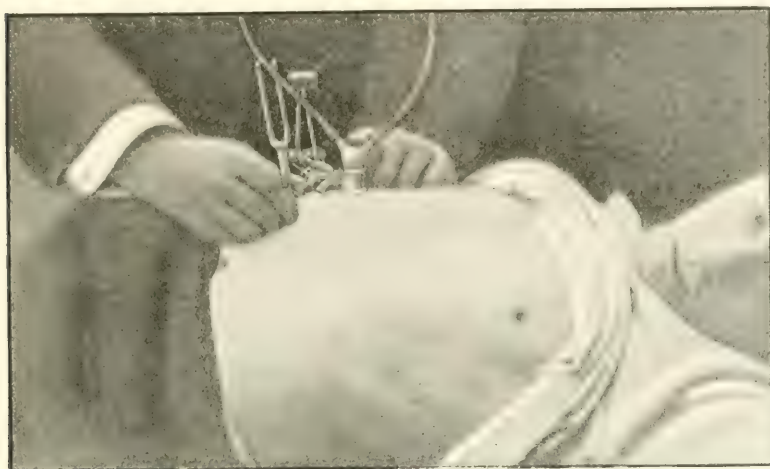


FIG. 17. —A tuning-fork with hammer attached.

The dimensions of the heart, and its relation to the lungs, can be readily gauged when the stethoscope is placed on the chest over the cardiac area and the tuning fork is made to pass in various directions over the area occupied by the lungs around the heart.

He has also been making observations on the different tones which seem specific to different affections of the liver. In general, a fatty liver conducts sound less loudly than a cirrhotic liver. Special tones may be traceable in other ailments; but the evidence is not sufficiently advanced to tabulate the method.

In fractured bones, the method is also applicable. The stethoscope being placed over one end, say over the great trochanter of a fractured femur, the vibrating tuning-fork placed on the lower end of the bone,

¹ Jahrb. f. Kinderheilk., Berlin, 1913, vol. lxxviii.

² British Medical Journal, February 21, 1914.

just above the knee, cannot be heard so well on the femur of the sound side. A fractured rib can also be recognized from its intact neighbors; and when the stethoscope is placed far back on the shaft and the tuning fork far forward, it is easy to detect the difference between the note in the fractured rib or ribs and the sound given out by the ribs above and below. A doubtful fracture of the sternum, or of the collar-bone, can be detected in a similar manner.

ACROMIAL BREATHING has been studied by Nathan Magida,¹ as an aid to early apex diagnosis, on the lines of R. Abrahams² published experience that auscultation over the acromioclavicular joint amplifies the auscultatory sounds originating at the apex. In a series of 52 cases, he found that acromial breathing was present in all the 28 first-stage cases; in 8, out of 14, second-stage cases, and in 2, out of 10, third-stage cases. His conclusion is that the method deserves a place in physical diagnosis. Frank A. Bryant³ also writes to remind us of it.

THE SPUTUM.

The Estimation of Albumin in the Sputum by Potassium Ferrocyanide. Holm and Himmelberger's⁴ method has special advantages. They state that it is as easy as that of albumin in the urine, and of greater importance, as one of the best aids to diagnosis and prognosis in phthisis. It identifies the sputum as coming from some deep-seated inflammatory process.

THE CLINICAL IMPORTANCE OF THE REACTION is questioned by W. Milton Lewis.⁵ Biermer (1855) had demonstrated the reaction, and advanced it as bearing a definite relation to the cellular content; though Renk failed to obtain it in chronic bronchitis. More recently, different methods and different results have been recorded; the latest view being that the value of the test is not in the presence but in the amount of the albumin. Lewis's research resulted in the detection of albumin in the most varied conditions, including the common "American Catarrh." His deliberate conclusion is that this examination is "of no practical importance, so far, at least, as the diagnosis of tuberculosis is concerned."

THE RESPIRATORY GASEOUS EXCHANGES; AND RESPIRATORY TREATMENTS.

The Respiratory Study of Acidosis. Vandell Henderson points out that the recent investigations on acidosis are largely dependent upon a

¹ New York Medical Journal, December 27, 1913.

² Archives of Diagnosis, April, 1913.

³ Journal of American Medical Association, May 23, 1914.

⁴ Ibid., January 3, 1914.

⁵ New York Medical Journal, May 23, 1914.

study of the respiratory mechanisms and events. While in diabetes, in renal disease, and in the healthy at great altitudes, the alveolar percentage of CO_2 serves as an index, much can be learned from self-observation under varied experimental conditions, in particular the following: Forced breathing; holding the breath as long as possible; re-breathing; effects of carbon dioxide and oxygen; reflex inhibition of the respiratory centre by distention of the lungs; oxygen consumption during rest and work; artificial respiration; determination of the CO_2 in alveolar air; metabolism experiments during rest and exercise with the Douglas bag; the dead space of the respiratory tract. In this way, the healthy subject may be utilized as a more reliable *Versuchstier* than experimental animals.

Anemia and Vitiated Air. S. F. Krotkoff's¹ experiments show that healthy rabbits lose weight, but "keep a normal blood," even after two months spent in the foul air of closed boxes (with 8 to 10 per cent. CO_2); while subsequently the cellular and hemoglobin percentage can be considerably reduced by injecting phenylhydrazin. The number of leukocytes also remained unaffected. His inference is that the pallor from confined air is a pseudo-anemia only, without numerical changes in the blood, except in individuals suffering from some morbid predisposition of the blood-making organs.

Oxygen Starvation for Anemia. Under this heading we are reminded that O. David,² on the strength of a marked numerical increase of red cells in dogs kept in an atmosphere containing only 10 per cent. of oxygen, was able to obtain, in 13 cases of anemia, chlorosis, and pernicious anemia, an increase in the number of cells and in their hemoglobin by a daily sitting of two hours in that same atmosphere.

Open-air Healing is Nature's way, under the protecting scab, for which Lister substituted the aseptic dressing. That admirable refinement guards against the pathological culture of germs locked in by sutures. When, as in the open ulcer (mucous, as well as cutaneous), there are no sutures, nor any diligent covering up, the germs flourish, but they become saprophytic, provided sufficient oxygen be supplied. Evaporation does the rest; and in that respect simple airing in a draught is perhaps better than the oxygen confined in George Stoker's oxygen cases for old, chronic ulcers. I first realized this years ago when seeking to heal the latter by the circulatory stimulus of intermittent local constrictive "absolute anemia." The final healing of one of them which persistently refused to close was accomplished in twenty-four hours by removing the dressing and keeping the bare leg outside the bed-clothes. Much could probably be achieved by that simple method when duly combined with elevation, and other elementary indications. For the deep recesses of the moist mucous membranes, something more

¹ Russky Vrach, January 18, 1914.

² Deutsch. Arch. f. klin. Med., December, 1911.

is needed; but the same principles obtain. The scab is glutinous and adhesive, excluding from the septic culture the open air is inspired, and it may resist sprays or irrigations. The essence of a theory and practice which are widely applicable is condensed in G. Burnet's¹ successful prescription for atrophic rhinitis, sinusitis, etc., as a foundation for any additional treatment: "An early morning motor ride." This will so stimulate the glands that any tenacious crusts or discharge will be loosened by *vis a tergo*.

The Proportion of the Carbon Dioxide Output to the Total Pulmonary Ventilation in Emphysema. Rudolf Reinhardt² finds that in emphysema any increased frequency and depth of the respiratory act leads to an increase of from 41 to 50 per cent. in the volume of air respired per minute. The percentage of carbon dioxide is reduced below the normal; but the total elimination of it is increased; perhaps, he suggests, owing to the increased muscular labor of breathing. When additional carbon dioxide is supplied with the inspired air, the whole of it is not completely eliminated; and it is also noted that, under that stimulus, the increase in depth of respiration is not so quickly brought about as in health, neither does it reach the same degree. His main conclusion is that the respiratory mechanism is impaired in emphysema, with special reference to the elimination of carbon dioxide.

The Respiratory Treatment of Scoliosis. In connection with the remarks ventured in our last September's Report upon a subject of mutual surgical and medical interest, under the headings of Spinal Culture, and of the "Respiratory Treatment of the Spine," we may refer to L. Ombrédanne's³ orthopedic analysis of the theory and practice of Abbott's procedure, and of its value as a means for training the patients to respiratory efficiency. This is the converse aspect of that medicosurgical reciprocity, the "Spinal Treatment of the Respiration." He contributes the best of practical testimonies to that intimate nexus, by associating with his own employment of the surgical method (in those cases which he defines as being most suitable for it), a systematic control of its beneficial respiratory results. These he carefully registers with the spirometer. Yet he fails to definitely specify his recognition of our main principle, an early correction of functional spinal deviation by the physiological mechanical forces of respiration, namely, by a timely reëducation of the "symmetrical respiratory function" which is primarily at fault.

Oxygen Sub-cuten for Nervous and Mental Affections. M. Dardel,⁴ inspired by Toulouse's results, has used, with success, injections of 300 to 500 c.c., in 12 cases, including instances of inveterate insomnia or

¹ British Medical Journal, April 18, 1914.

² Deutsch. Arch. f. klin. Med., vol. cix.

³ Presse méd., January 3, 1912.

⁴ Rev. méd. Geneva, February 20, 1914.

restlessness in which the drugs previously administered were rendered superfluous. He has found them harmless, and is convinced of their sedative efficacy even for chronic mental disorders.

Toulouse and Puillet's¹ technique is simple. The gas is injected under the skin of the thigh by driving into the bottle containing it the water from a second bottle into which air is pumped at will by means of a rubber handball. Their results in acute psychoses, in dementia, and in excitement and insomnia have been excellent in most cases.

MEDIASTINUM AND GLANDS.

Rapid Radiography of Tracheobronchial Adenopathies. Albert Weil and Auclair² contend that the *x*-ray diagnosis of adenopathies of the mediastinum and hilus should be assisted by almost instantaneous radiography, which yields on each side of the heart a large, clear zone with branching, fanlike striae, mainly bronchioles. When glandular nodules, due probably to fibrous or calcifying processes, are found along these striae, they may appear on the *x*-ray screen as opacities in the hilus shadow. But should the lesions be very small, they give no trace on the screen; and though the pulmonary fields bordering the median cardiovascular shadow may be rather more grayish than normal, the difference is almost indistinguishable, even to the experienced eye. A frontal, one-fifth of a second, radiograph shows adenopathies even so small as the size of a large pin's head. During the inspiratory phase, one may see, between the shadow of the heart and that of the vertebral column, a relatively clear space lightly dimmed in the centre by the shadow of the tracheal bifurcation. In any considerable mediastinal lesions, dark markings obscure the clear space to a greater or smaller extent; but, with small lesions, only the slightest shading is distinguishable on the screen, and this makes definite conclusions out of the question. The rapid radiograph, on the other hand, enables the lesions to be perfectly localized and enumerated. It should be taken even when the screen examination appears to show the integrity of the pulmonary field.

Epidemic Cervical Adenitis with Cardiac Complications. Under this heading, the *British Medical Journal* (Feb. 21, 1914) publishes two contributions from Cheltenham. Fourteen clinical cases are reported by S. T. Pruen; and bacteriological examination and conclusions are given by Robert Kirkland, who found that swabs taken from the throat revealed a streptococcus, and the blood examination, when it was positive, showed also a streptococcus, hemolytic in one case. Pruen has heard of similar epidemics in Great Britain and Ireland, in Belgium,

¹ Bull. Soc. Méd. des Hôp., July 24, 1913.

² Bull. et mém., December, 1913.

France, Saxony, and America. In the Cheltenham series of cases, the incubation period seemed to be three or four days. The peculiar feature of this disease is the glandular affection. The glands are unusually large, unusually tender, and unusually numerous; so large and so tender that medical men and laymen have sometimes asked the question "Is this not a case of oriental plague?" But the most important clinical characteristic is the insidious onset of cardiac lesions, which happily are, in most cases, slight. The dilatation, under rest, is temporary; but a murmur may persist. Pruen thinks that there must be a number of unsuspecting patients with cardiac lesions walking about, and, by doing so, endangering the integrity of their hearts.

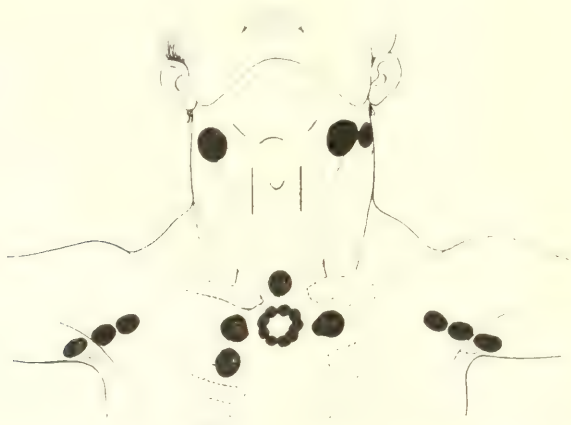


FIG. 18. Youth. Slight tonsillar congestion; glands enlarged three days; stridulous breathing two days; intermittent irregular beat.

As to nosology, this epidemic disorder is not mumps or rheumatism, or septic tonsillitis; nor, as he was at first disposed to call it, influenza. Neither is it glandular fever; from this it differs by the absence of the nephritis, except in some cases, and of enlargement of the spleen or liver, or of the mesenteric, inguinal, and axillary glands; and by the presence, in almost all cases of tonsillitis and pharyngitis, and in many of them of a mild carditis or endocarditis. Moreover, adults are more frequently attacked than adolescents, and adolescents than children. He regards it as a new or hitherto unrecognized infectious disorder caused probably by a new variety of streptococcus.

THE THYMUS AND THE THYROID.

Hyperthymatism should be looked for in asthma and in persistent bronchitis, as well as in tracheal or laryngeal stenosis. Philip H.

Sylvester¹ bases this view upon the double aspect of its symptomatology, toxic as well as mechanical. The asthmatic symptoms, sometimes obviously not due to pressure, are probably due to hypersecretion. The pressure symptoms and the toxic may combine; but the toxic are the more constant.

Haberer's² article on Thymus Hyperplasia and its treatment, and Klose's³ important contribution to the experimental pathology and to the surgery of the thymus, should also be consulted. Klose states that of 56 cases of thymic tracheal stenosis, 43 were completely cured by total or partial ablation. He draws attention to thymic cysts, and to hemorrhages as sometimes an unsuspected cause of sudden death at birth; and also to sclerotic atrophy from defective nutrition. Primary defects and faulty development of the gland frequently coexist with abnormal mental states. The etiological influence of aplastic and hypoplastic conditions of the thymus also needs further investigation in connection with cretinism, mongoloid idiocy, and chondrodys-trophic dwarfism.

The Question of Thymectomy in Exophthalmic Goitre is discussed by C. Lenormant.⁴ It was first performed by Garré (1911), together with a unilateral thyroidectomy; and at least fourteen times by various operators since, with only one fatality, namely, in one of the five pure thymectomies hitherto recorded, the others having proved clinically beneficial. In the most severe of Haberer's 6 cases, it seems to have been life-saving. Thymic hypertrophy is a frequent complication, though not constant, and, according to Melchior, apt to be absent in the worst cases. Capelle (1908) found a large thymus in 43 out of 60 autopsies (70 per cent.) Matti (1912) found a hypertrophied thymus in 75 per cent. of 133 necropsies. It is often missed by palpation and percussion, whereas radioscopy of 20 cases by Schultze showed the presence of a thymic shadow in 18 instances. This examination should be more often adopted.

The provisional conclusions are: (1) when, at the ordinary operation, a persistent thymus is detected, its removal is desirable and safe; (2) when it is discovered clinically, a resort to the combined excision of the glands should be preceded by a thorough treatment of the thymus by x-rays; (3) when a thyroidectomy has failed to cure, careful search should be made for signs of thymic hypertrophy, with a view to x-ray treatment and, if necessary, secondary excision.

X-rays for Thymic Asthma. T. Luzzatti⁵ reports great improvement in two severe infantile cases. In 1912, Weil could collect only 11 cases in which the x-rays had been employed for the treatment of the enlarged

¹ Boston Medical and Surgical Journal, April 2, 1914.

² Mitt. aus. d. Grenz., 1913, vol. xxvii.

³ Abstracted in Journal of American Medical Association, January 31, 1914.

⁴ Presse médicale, February 14, 1914.

⁵ Riv. Osp., 1913, iii, 689.

thymus—in all the cases with success. One failure has since been recorded. As to the strength of the irradiation, Regaud and Cremieu (1912) recommended a single massive dose, 16 Holtzknecht units in thirty-five to forty-five minutes, with a second smaller dose three weeks later, if necessary. Luzzatti gave weak daily doses with x -rays, taking half an hour to change the color of a Sedillot pastille.

Graves's Disease and Thyroidectomized Woman's Instead of Goat's Milk. The unusual instance related by Pychlau¹ lends some support to the therapeutical method in question. The sister of his severely affected patient had previously had her thyroid removed, and, owing to the death of her child four days old, had no use for her milk. Under his advice, four daily supplies of 200 c.c. of it were taken by the patient regularly for four months. Many forms of treatment had been tried previously in vain; but, under this, the improvement was great, and conspicuous in all the clinical aspects.

The Radium Treatment of Mediastinal Tumors. In the report for 1913 of the London Radium Institute, A. E. Hayward Pinch² speaks favorably of the effects of treatment upon *mediastinal tumors*, which, in one or two cases, showed, under x -rays, a definite decrease in size. It also seemed to exert a remarkable action in lessening the tendency to a reaccumulation of the fluid after paracentesis of the pleura. As much as 400 to 500 mg. is indicated, with heavily screened applicators, arranged for a maximum "cross-fire" irradiation; and a persistent treatment with a total exposure of not less than thirty hours, to be repeated at the end of four weeks. The resulting feeling of fatigue and exhaustion passes off in about a week.

IN EXOPHTHALMIC GOITRE CASES, of which only few had been treated, three or four weeks usually elapsed before any effect was perceived from exposures with a total duration of thirty or more hours, and with a heavily screened apparatus containing 200 to 300 mg., but subsequently there was appreciable improvement in the gland, the heart, the proptosis, and the tremor. The same course should be repeated at intervals of three or four months.

No special mention is made of diseases of the blood or bloodvessels. But in arthritis deformans some remarkable results were obtained, particularly in the earlier polyarticular cases, by daily administration of 250 c.c. of radium-emanation solution of a strength not less than 1 millicurie per liter. Osteophytes cannot be absorbed, but periarticular stiffening is often benefited. The mode of action is complex and imperfectly understood, but, among its factors, he mentions the reinforcing of the body ferments, the increase of tissue oxidation, and the dissolving of uric acid.

Nitron as a Therapeutic Agent is the title of an interesting paper by Sir Wm. Ramsay³ describing the method of using the emanation, which

¹ Deutsch. med. Woch., 1913, No. 47.

² Lancet, May 23, 1914.

³ Ibid.

he had first tried in 1904, and pointing out the economy of its use, as it is perpetually given off and as niton has a radiating power 75 per cent. of that of the radium which supplies it.

THE PLEURA AND ITS TREATMENT.

Shoulder-pain in Pleurisy is the title of a paper by D. Gerhardt,¹ on referred pain, from a surgical standpoint. While seven patients were sent to him for appendectomy, with abdominal pains which ended in pneumonia, in four others the pain was in the shoulder, with physical signs of basic pleurisy or pneumonia, and therefore presumably of phrenic origin. The lesson pointed by these mistakes is obvious. But in mixed cases, a differential diagnosis is sometimes as difficult as it is responsible. The clinical essential is to eliminate the possibility of an acute appendicitis. For this our requirement is, as we have previously insisted, some reliable negative test, in short, a reliable test for "appendicular soundness."

Hemothorax. In Mackinlay and Weeks's² case of ruptured thoracic aneurysm the man survived the sudden onset of violent pain for thirty-six hours. In T. Bushby's³ case of Spontaneous Hemopneumothorax, due probably to rupture of a small cavity and of a small vessel, the youth, aged seventeen years, completely recovered after staying in the hospital from July 21 to October 29. Only one tapping (1 pint) was performed.

RECOVERY FROM HEMOTHORAX DUE TO A RUPTURED DISSECTING ANEURYSM. Edward H. Goodman's⁴ account of his remarkable case is followed by an interesting review of the literature of the subject, and also of that of spontaneous rupture of the aorta in cases free from aneurysm. He finds that aortic aneurysms rarely rupture; only 32 instances (0.69 per cent.) having been reported in 4593 cases.

Autoserotherapy in Serofibrinous Pleurisy has been used by C. A. Pfender⁵ in three cases, and gets his decidedly favorable indorsement after an analysis of 565 cases recorded since 1894, which showed benefit in 31 cases, and a cure in 424. In large effusions, 10 to 200 c.c. of fluid are aspirated, and, before withdrawing the needle entirely, 2 to 3 c.c. are reinjected under the skin of the patient. The autoserum injections are repeated every other day. These small doses give the best results without any danger.

Bülav's Treatment for Empyema. Continuous drainage is an obvious indication which has often been attempted, and as often has failed, for

¹ Münch. med. Woch., December 30, 1913.

² British Medical Journal, December 27, 1913.

³ Ibid.

⁴ Journal of American Medical Association, April 18, 1914.

⁵ Washington Medical Annals, March, 1914, vol. xiii.

septic reasons. Brau-Tapie¹ relates his successful employment of Bülay's method in a child of nine years, completely cured within five weeks. The principle is the same as before, drainage into a flask containing an antiseptic fluid, and air in communication with the outer air through a second shorter tube perforating the air-tight rubber plug. After the local application of iodine and of novocain, a trocar (8 to 9 mm. in diameter) is pushed into the pleura through a transverse incision, the greater part of the pus is evacuated, and a drainage tube of suitable length is introduced and secured to the skin by Reverdin needles and sticking plaster, and joined up with the longer tube of the flask. Bülay bandages the flask to the thigh, but the author secures it at the waist by a simple bandage looped over the opposite shoulder. A regulating clip may, or may not, be used. The method is applicable to all recent purulent pleurisy, but not to chronic tubercular or encysted empyemata. The same method is also described by B. Hahn.²

Progressive Partial Evacuations alternating with mechanical and other measures to promote retraction, are the latest treatment recommended by Spengler and Sauerbruch³ for tubercular hydrothorax, on the strength of a trial in thirteen patients, four of whom were able to return to work. Under that plan, the effusion gradually diminishes, with corresponding gain in respiratory and general fitness.

The Prophylaxis of Serous Adhesions by Artificial Means had been initiated in the pleura by Otto Grünbaum's tentative injections of liquid paraffin. Saxton Pope's⁴ experimental investigation, conducted in the peritoneum of rabbits, aims at a chemical, rather than a purely mechanical, method; on the assumption that the production of a fibrous exudate is dependent upon the liberation of thrombokinas, its activation on prothrombin in the presence of calcium, and the production of thrombin which converts fibrinogen into fibrin. The materials employed to counteract the active thrombin ferment which is liberated in excess of the normal thrombin element, when the endothelium is injured by exposure or scarification, consisted of camphorated oil, olive oil, petrolatum, butter, sugar (50 per cent. solution) egg albumen, milk, citrated sugar, citrate egg albumen, milk, peptonized milk, Ringer's solution, normal saline, ammonia oxalate (1 per cent.) in salt solution, citrate of soda (1 per cent.) in salt solution, citrate of sodium (2 per cent.) in solution of sodium chloride (4 per cent.), and citrate of soda (2 per cent.) in salt solution (3 per cent.)

The best results were obtained when citrate of soda (2 per cent.) in hypertonic salt solution (3 per cent.) was used, presumably because that hypertonic solution remains longer in the peritoneum than

¹ Prov. méd., November 22, 1913.

² Deutsch. med. Woch., September 18, 1913.

³ Münch. med. Woch., December 23, 1913.

⁴ Annals of Surgery, January, 1914.

normal saline. This suggests a treatment by the application of small quantities of solution of normal saline containing 1 or 2 per cent. of citrate of soda. It is noteworthy that, in Pope's experiments, camphorated oil produced the most extensive formation of adhesions. A thick, creamy deposit occurred, with masses of fibrous lymph and dense resistant adhesions throughout the entire abdomen.

Pleural Effusions. THE ADRENALIN INTRAPLEURAL INJECTION TREATMENT dates several years back, and was advocated by Sir James Barr, and by the writer, with different methods. Recently, Wedensky¹ has used 3 to 5 minims, and Valkova, in children $2\frac{1}{2}$ to 5, and in one case 8 minims. Their results were favorable.

PERMANENT AUTODRAINAGE OF ASCITES, whether by irrigation into the subcutaneous areolar tissue, by direct anastomosis with the portal vein, or by Ruotte's method of suturing the saphena to the peritoneum, constitutes a serious interference with the normal economy of the general and lymphatic circulation, and of the blood. Perinoff's² method belongs to the first group; but his paper reviews the results of some of the others. Almost concurrently E. Schepelmann³ was using, instead of Perinoff's silver catheter split T-shaped at one end, a human excised varicose vein hardened in formalin, or the aorta of a calf, to avoid all irritation and proliferation. These facts may conceivably have some practical bearing upon the treatment of some forms of hydrothorax.

Artificial Pneumothorax. THE VALUE OF THERAPEUTICAL PNEUMOTHORAX has been variously assessed. T. Tuffier and G. Loewy regard it as a step toward an earlier therapeutic attack upon the bacillary lesions. These should be immobilized, or excised. J. S. Ford⁴ thinks the field is at best limited, and not likely to expand. W. C. Voorsanger⁵ restricts the choice to cases which, after fair trial, do not respond to other treatment. A. Angelini,⁶ failed in two cases of hemoptysis, and in some others, owing to adhesions. The "anatomical" factor governs the situation. E. Rochelt⁷ seeks to facilitate the procedure by means of a permanent "retention-trocar," for greater ease of refilling. Air would then be available instead of nitrogen. By the constant play of the fluctuations in its absorption, it would help to keep the elasticity of the lung exercised.

The Therapeutic Value of the Pleural Methods of Nitrogen Displacement and of Oxygen Replacement is discussed by H. Morriston Davies.⁸ He considers that the general opinion that nitrogen displacement should

¹ Semaine méd., September 10 1913.

² Arch. gén. de chir., November 25, 1913.

³ Virchow's Archiv, November, 1913.

⁴ Medical Record, May 2, 1914.

⁵ Journal of American Medical Association, May 9, 1914.

⁶ Riv. Osp., November 15, 1913.

⁷ Wien. klin. Woch., November 20, 1913.

⁸ British Medical Journal, April 25, 1914.

be reserved as a last resort is a great misfortune. It deprives the patients of the treatment while they are in a position to benefit by it, and brings discredit to the method. No case, so long as it is progressive, can be regarded as too early for treatment by nitrogen displacement. The acute early lesion will respond much more readily than the old fibrotic lung, and the proportion of failures in finding a free pleural cavity will be considerably smaller. Every case should be radiographed when first seen. The patient may receive suitable medical treatment for three months. Then, at latest, must be again radiographed, and a comparison made of the previous plates and the clinical findings with those observed before treatment. Unless the patient show very definite evidences of improvement, the nitrogen displacement should be immediately attempted. Nay, during that period of three months, if the disease is progressing, a second radiogram must be at once taken, and, if this is confirmative, the displacement should no longer be deferred. A sudden hemoptysis must be regarded as evidence that the disease is progressive.

The disease need not necessarily be confined to one lung, provided there is sufficient healthy lung tissue on the opposite side (about two-thirds). There are three types of cases, however, in which this treatment is particularly suitable: (1) those in which there is a persistent rise of temperature; (2) those in which there is profuse or repeated hemorrhage; (3) those in which there is cavity formation in one lung. Acute miliary tuberculosis, when confined to one lung, is no contraindication. Peribronchial infiltration which could not be detected by the radiogram is indispensable to determine the condition of the less affected side beforehand.

Artificial Pneumothorax in Hemoptysis. P. Masenti, M. Borgogno and R. Vergano¹ describe the treatment of five patients with severe hemoptysis. The amounts of blood spat up varied from 500 to 1500 c.c. in from four to eight days. The hemoptysis ceased promptly in four of the cases after the first injection of N₂; in the fifth, three were found to be necessary, of 300, 400, and 400 c.c. respectively. In the other four cases, from 250 to 400 c.c. of N₂ were used. In no instances was a complete pneumothorax produced, nor was a positive intrapleural pressure reached. The cessation of the hemoptysis cannot have been due to immobilization of the lung, nor to a high intrapleural pressure. The authors ascribe the success of this line of treatment to some change in the condition of the pulmonary circulation, without making any suggestion as to what its mechanism may be. It is noteworthy that the earliest performance of the operation suggested in 1882 by Forlanini, was carried out successfully under general anesthesia in 1885, in a patient of W. Cayley at the Middlesex Hospital. The hemoptysis,

¹ Giorn. d. R. Accad. di Med., 1913, vol. lxxvi.

which had been severe and persistent, was found, after death, to have originated from a pulmonary aneurysm.

PNEUMOTHORAX FOR EARLY LUNG HEMORRHAGE. The three favorable cases reported by L. S. Mace,¹ of San Francisco, were not quite early (the earliest had a six months' duration of illness), and the hemorrhages were slight only. He instances them to advocate an earlier resort to the method, to illustrate the curative indication of rest for hemorrhage, and also to point out that, with some modifications, it is applicable to other phases of this disease besides advanced and progressing one-sided lesions. He offers the following conclusions:

1. Air, or a mixture of air and nitrogen, is better than nitrogen for lung compression in early cases of tuberculosis complicated by hemorrhage.

2. In case it is desired to continue the compression, it is easy to follow the first injection by nitrogen until complete compression is attained.

3. Air is safer in the first operation than nitrogen, for the reason that if some should escape into the veins it would be more quickly absorbed and the danger of gas emboli decreased.

4. Partial collapse is effective in controlling hemorrhage, and the primary operation with the air or air-nitrogen mixture is more simple and better adapted to the treatment of early cases.

ARTIFICIAL PNEUMOTHORAX IN LARYNGEAL TUBERCULOSIS. According to Zink,² almost every pulmonary and laryngeal tuberculosis can be treated with marked advantage by this method. Twelve out of 75 patients materially benefited by the treatment were suffering from a laryngeal complication. All the milder cases were cured. In 5 severe cases, with one exception, no further treatment than the pneumothorax and the application of a powder or menthol solution locally, together with complete rest of the voice, was used. An intestinal tuberculosis rendered that case more difficult to treat than the others. In a number of his cases, he regards the cure as permanent. The good results are ascribed to the arrest of the pulmonary disease, to the cessation of the severe attacks of coughing, and to the limitation or suppression of the sputum. The disappearance of the bacilli from the sputum is also a powerful factor. Pending the results of a publication of his general experience in treatment of pulmonary tuberculosis he states that he would only refrain from resorting to artificial pneumothorax in cases with laryngeal complication when there is a non-localized perichondral process, especially of the epiglottis, setting up severe dysphagia and ulcerative processes extending over the whole of the inlet of the larynx with an ominous edematous swelling.

THE INFLUENCE OF PNEUMOTHORAX UPON THE CORPUSCULAR RICHNESS OF THE BLOOD. The effect upon the blood is not mere concentra-

¹ Journal of American Medical Association, December 20, 1913.

² Münch. med. Woch., September 2, 1913.

tion. It has been compared to that induced by the altitude, in the rapid increase in the number of erythrocytes and in their hemoglobin, attributable to an unusual stimulation of the blood-forming organs. The facts have been studied by K. Bürker, R. Ederle, and F. Kircher.¹

Thoracoplasty. THE LATEST COLLAPSE-THERAPY for closing cavities or rapidly healing old tubercular effusions and empyemas is M. Wilms's² Systematic Multiple Paravertebral and Parasternal Costectomy, of which he describes the good effects in several cases. The muscular respiratory function is not lost; and the risk of secondary infections does not exist as in other methods. The resections, which may be completed at different sittings, may have to be made from the eleventh rib to the first dorsally; and anteriorly, from the first rib to the seventh. Under the greatly increasing frequency of the operation of pneumothorax, this method is likely to have to deal with numbers of its failures, and to be able to do so satisfactorily.

The same number contains a description by H. v. Baeyer how he restored the lost inspiratory power of one side of the chest when all the ribs had been partly resected. A firm, padded shield, fitting tightly to the surface during expiration, was applied to the chest from the axilla to the waist. This was an immediate and effective remedy for the inspiratory sucking-in of the lateral region of the thorax.

SCALENOTOMY FOR APEX TUBERCULOSIS. The latest criticism of Freund's "preventive" chondrotomy and of his theory (1858 and 1912) of a short first cartilage and a narrow aperture as the cause of apex predisposition is based by Sato³ upon an extensive anatomical, physiological, pathological, clinical, and experimental investigation of the whole question at Göttingen, to prove that the operation produces the reverse of that which is intended, and deprives the first rib of all respiratory movement. Instead of increasing apex ventilation, it immobilizes the apex. In that sense it fails of its object as a preventive. Its real use could only be for the treatment and the cure of the apical disease in progress. His practical conclusion is obviously based upon an entire belief in the doctrine of tissue rest. To insure that "curative" apex immobility, he proposes to improve upon Freund's procedure, by dividing the scaleni instead of the cartilage; and he advocates scalenotomy as a plausible treatment for every case of apex tuberculosis. That purpose is at variance with the curative results of artificial pneumothorax, which demonstrates that due ventilation is needed to protect the apex against tubercle; and yet more ventilation to cure it.

¹ *Zentralbl. f. Physiol.*, 1913, xxvii, 623.

² *Deutsch. med. Woch.*, April 2, 1914.

³ Seiiichiro, *Zur Lehre von dem Thorax Phthisicus und den Operationen der Lungenspitzen tuberkulose*, *Deutsch. Zeits. f. Chir.*, December, 1913.

ASPHYXIAL PULMONARY CONDITIONS; AND THEIR TREATMENT.

Acute Pulmonary Edema is classified by Leclerc¹ as: "Mechanical" by rapid pleural paracentesis, particularly in tabes, ascending myelitis, and mitral stenosis; or "infectious," as in influenza, pleuropneumonia, etc.; or "toxic" as in uremia from granular kidney, alcoholism, or in pilocarpin, or serum injections. He dwells upon a pulmonary factor, largely associated with the cardiac and the nervous, of deficient respiratory hematosis and elimination.

Exclusive Diaphragmatic Breathing is the inevitable consequence of experimental, accidental, or pathological, *absolute disablement* of the spinal cord at a high level. It is sometimes temporary and remediable, as in transverse compression, hemorrhage, or curable disease. When, however, it results from permanently destructive causes, it is practically incompatible with a prolongation of life. This is due to the fact that the diaphragm is purely inspiratory. That exclusive type cannot be imitated in health by our "voluntary diaphragmatic breathing," because in this the expiratory abdominal muscles, paired with the diaphragm, preserve both their tone, which insures a rhythmic "passive" expiration by their elastic recoil and that of the abdominal gases, and also their rhythmic "active" contraction, if this should be required. So long as that disablement remains absolute, we have to deal with an unexampled crippling of the respiratory mechanism, namely, an active rhythmic inspiratory force—without any rhythmic expiratory force. There is still a steady "tensive" intra-abdominal pressure; but this can only favor expiration at the cost of opposing the inspiratory efforts of the diaphragm, and of gradually wearing them out. The added evil is that the effective work of the diaphragm lies at the back; and that, in the inevitably dorsal decubitus, the weight of the body steadily opposes the expansion of the bases, which are at the time absolutely the only respiratory reserve, and hastens their massive collapse. That trouble might conceivably admit of some alleviation, if we could construct for those cases a *respiratory bed*, to rest the body upon three suitable air cushions; one along the spine, another across the upper thorax, and a third across the lower part of the trunk, thus relieving the posterior and lateral bases from all pressure. At best, this would be only an instalment; but, to be of any use, it would brook no delay in its application. Whenever, in cases not absolutely hopeless, a determined attempt at life-saving surgical or medical treatment is contemplated, the first essential for success is an immediate resort to respiratory treatment, to preserve as much of the advantage from a still normal basic condition as can possibly be saved. Any

¹ Jour. des Prat., October, 1913.

continuously acting substitute for the lost abdominal tone, such as the prone decubitus, or a light elastic abdominal belt, being out of the question, the main rational indication is to supply the missing rhythmic expiratory force. This leads to a second even more vital consideration. There seems to be no escape from the conclusion that, for a truly thorough treatment of that exclusive diaphragmatic breathing so long as it lasts, there can be no adequate alternative to the application of a rhythmic *manual artificial expiration*, to be judiciously kept up day and night by a relay of highly competent hands, in analogy with the digital compression of arteries for hemorrhage or aneurysm.

These limited clinical remarks, at the extreme fringe of the wide subject under discussion in H. L. Tidy and E. Phillips's¹ paper on *Acute Lobar Collapse of the Lung*, and in T. R. Elliott and L. A. Dingley's² paper on *Massive Collapse of the Lungs after Abdominal Operations* have some practical bearing upon the whole of it. The approved posture in the treatment of the local massive thoracic and pulmonary collapse and the abdominal atony of rickets, of the respiratory urgencies (due to scattered lobular collapse) of bronchopneumonia and of whooping cough, and of many analogous instances of disablement by collapse, including phthisis, is still exclusively dorsal. I need, therefore, only renew the old plea for some revision of the therapeutical question, and for some wider clinical recognition of the practical uses of the prone decubitus, and of its abdominal factors, in the light of the anatomy and physiology of the respiration and of the circulation.

The Treatment of Asphyxia from various causes, and in different types of subjects, is detailed by Grober,³ on well-known practical lines for maintaining or restoring the respiratory and the circulatory function. Watchful after-care is essential, even in milder cases, to guard against the not unlikely occurrence of a secondary relapse.

For Bronchopneumonia in Children, Abraham Goltman⁴ trusts to heroic measures, under a nourishing liquid diet, with temperature and pulse for guides as to the use of stimulants. The ice-pack can quickly reduce the temperature. When mucous rattling is heard, when the respirations are increased and dyspnea and cyanosis are present, he aims at one thing, to *keep* the respiratory centre alive. Plunging the child into a warm bath and then wrapping it up in a cold sheet, or pouring from a height hot and cold water alternately on the patient's chest will induce cough and expel the mucus.

The Hypostatic Paravertebral Pneumonias of Infants are not, according to A. Czerny,⁵ at present on the increase, like bronchitis and other

¹ Lancet, May 2, 1914.

² Ibid., May 9; cf. "Correspondence," May 16, 23, 30

³ Deutsch. med. Woch., December 25, 1913

⁴ New York Medical Journal, December 27, 1913.

⁵ Deutsch. med. Woch., April 2, 1914.

forms of pneumonia. The reason is that, owing to greatly improved dietetic hygiene, the diaphragm is much less often kept too high by intestinal fermentation, or else imperfectly worked up by a collapsed intestine.

The Treatment of Stillbirth Asphyxia is conducted by C. Sakaki¹ on the principles; (1) an air pump works more powerfully when the piston is driven quickly; and (2) any air-bubbles which have entered into a capillary pipette, together with water, are difficult to get rid of except by thorough shaking. Facing the operator, whose two forefingers hook over the shoulders under the axillæ while both thumbs meet under the chin and clavicles, and the other fingers grasp the back, the suspended infant whose flexed arms are pressed against its sides, is to be shaken, not violently, but rapidly (120 to 150 shakes per minute), by a loose action of the operator's wrists. A few seconds of this will cause air to enter audibly. The feet are next seized, and the body inverted to empty the chest of fluid mucus; the former proceeding being then repeated. All can be done before the cord is divided, and continued until natural breathing is induced. He states that this procedure has never failed him during years of practice. The alleged risk of inhalation pneumonia does not count against that of immediate death.

Heart Massage as an Aid to Resuscitation for Stillborn Infants. There is a pleasing directness in the original method suggested by Robert E. La Rue.² The difficulty is in the rhythm; this is also true, but much more obvious, in aided respiration; it would never do to work the chest *à contre-temps*, and to squeeze it at the moment it is trying to expand. The author's description will speak for itself: "The infant lies upon its back in a wide basin with water at 110° to 120° F., to completely cover the body, so that no water can enter the mouth. Both hands grasp the body, the thumbs resting upon the front, the fingers extending across the back, as in the Schultze method of artificial respiration. The left thumb should cover the third intercostal space close to the left border of the sternum; the right thumb, the fourth space in the mammary line. Now make deep pressure, first with the right thumb, which forces the blood out of both ventricles—from the right ventricle through the pulmonary artery to the lungs, and from the left ventricle through the aorta to the arteries of the body; then with the left thumb, causing both auricles to contract and forcing their blood into the ventricles. This alternate pressure should be made at the rate of one hundred a minute, until the heart is distinctly felt to beat of its own accord. Then it is safe to start artificial respiration. Of course, the attempt would be in vain if the infant had been dead too long, or if, after starting the heart, normal respiration could not be established."

¹ Deutsch. med. Woch., April 2, 1914.

² Pediatrics, March, 1914.

The Treatment of Hemoptysis. EMETIN IN PHTHISIS. Emetin has been used subcutaneously by J. S. Raeburn¹ in upwards of 40 cases, most of them hemorrhagic; each ampulla containing $\frac{1}{2}$ gram of emetin in 15 minims of distilled water. Observing that a copious blood-stained spitting was not only cleared of blood, but itself diminished or suppressed, he concluded that, by relieving congestion, emetin must act as a preventive and as a curative; and he proceeded to treat successfully non-hemorrhagic cases of profuse expectoration. For that purpose he resorted to a further dilution of that strength to one-quarter, equal to 0.04 cg. in each minim; and he found that 4 minims of this was a suitable dose. He recommends an extended trial of this method for the treatment of congestive and inflammatory pulmonary conditions. Truly we are puzzled no longer by the lack, but in the selection, of good cures.

According to Raeburn, its subcutaneous injection is efficacious, not only against the hemoptysis, as originally published by Flandin and Joltrain, but also against the catarrh of phthisis, which it may even completely suppress. In this result there is no bactericidal factor; the tubercle bacilli and the tuberculin remain unaffected. The curative mechanism is purely vasomotor; and it is dependent upon an adequate reserve of cardiac energy. The drug should not be used for weak hearts. Doses of 1.5 mg. are safe, and suffice to control congestion and catarrh.

P. A. Guerrero, of Buenos Aires,² has collected 28 cases, all favorable, of this treatment for hemoptysis. His own 8 cases were not so successful; he sometimes had to administer ten injections. He thinks 0.05 to 0.06 gram is a better dose than 0.04, as originally suggested.

THREE RECENT METHODS FOR HEMOPTYSIS are discussed by Morichau-Beauchant:³ Emetin, Pituitrin, and Serotherapy. (1) The good effects sometimes obtained with ipecacuanha led Flandin and Joltrain to use emetin hypodermically (0.04 to 0.12 gram in twenty-four hours). Albert Robin has recently reported that, in 6 severe cases, two daily injections of the smaller dose succeeded in 4 of them only, the other 2 being late cases. (2) Rist was the first to use pituitrin injections. In 12 patients injected intravenously with one decigram of the posterior pituitary lobe extract, the arrest was immediate. But, in 6 cases, bleeding recurred once or twice in the next days; it was again stopped in all but one case. In view of the temporary vertigo and faintness in some of them, Beauchant suggests dilution with serum. (3) Fresh serum supplies thrombin only for a few hours; but even when some days old, it still seems to favor coagulation. To avoid anaphylaxis from animal sera, healthy defibrinated human serum should be used

¹ British Medical Journal, March 28, 1914.

² Semaine médicale, December 25, 1913.

³ Jour. des Prat., January 24, 1914.

(30 to 40 c.c. into a vein or muscle). He has found this method efficacious, and believes in a great future for it.

Extensive use has recently been made of emetin in France¹ in various diseases besides dysentery, in particular in hemoptysis, in gastro-intestinal hemorrhage from typhoid, paratyphoid, and alcoholic hepatitis, in senile bronchopneumonia, and in acute and chronic bronchitis. Remarkable results are reported by Rénon, Josué, Ramond, and others.

Incidentally to emetin, F. Schmitter,² U. S. Army, reports rapid and good results in 6 cases of sprue, from muscle injections of the hydrochloride in 3, and skin injections in 3 others; the only slight objection being increased activity of the bowel. From India we are also supplied with varied experience³ of the beneficial use of emetin in dysentery, hepatic abscess, and other prevalent abdominal affections.

Chronic Bronchitis. THE DEHYDRATION TREATMENT FOR CHRONIC BRONCHITIS AND BRONCHIECTASIS, recently advocated by Singer, namely, a reduction of the total daily fluids to 400 or 500 c.c., with an allowance of up to 2 liters every fourth day, has been tried with some brilliant results by H. Hochhaus,⁴ in 14 cases which had proved refractory to other treatment. In 8 cases great improvement, or even recovery, was effected; in the remainder, the treatment had to be abandoned without improvement. A woman, aged forty-eight years, subject to cough, backache, and expectoration for many years, was admitted for right, extensive bronchopneumonia. The sputum (100 c.c.) contained the pneumococcus. The fever disappeared after eighteen days; but the expectoration and the physical signs over the lung persisted, in spite of expectorant drugs and Quincke's postural treatment. After a few days the thirst treatment reduced the sputum from 130 to 50 c.c. This, however, rose again on the days of grace. After a few weeks, the sputum had dwindled to 5 c.c., the general condition was satisfactory, and the lungs showed only slight bronchitis. During the first two days of the treatment, the patient felt unwell, the thirst was severe, the appetite poor; and she complained of a dry throat. On the third day she felt better, and the appetite had returned. One, of the 4 other cases narrated, was complicated by albuminuria. This improved, showing that Singer's exclusion of cases of nephritis may not always be necessary. The improvement may not be permanent, for none of the author's cases were observed for more than ten months. Among the failures under this treatment were 2 cases of phthisis, 1 case of bronchopneumonia due to a foreign body, and 1 case of bronchitis and bronchiectasis complicated by heart disease. Probably the success is due to

¹ Lancet, May 23, 1914.

² Military Surgery, Washington, D. C., April, 1914, vol. xxxiv.

³ India Medical Gazette, March, 1914.

⁴ Med. Klin., December 7, 1913.

several factors, and above all to an improvement in the action of the heart, which most often is unsatisfactory. He regards tuberculosis and nephritis as absolute contra-indications.

AUTOGENOUS VACCINE THERAPY FOR CHRONIC BRONCHITIS AND ASTHMA has been used in 16 cases by Pirie,¹ for average periods of nine and one-half months, with varying doses; the tendency being to increase them to the point of definite reactions in temperature and in a slight increase in the expectoration. He regards this treatment as an adjunct, rather than as a substitute, for the ordinary medicinal and hygienic measures. His experience, which does not extend to the "combined vaccines for colds" on the market, would seem to bear the interpretation that this special line does not lead to rapid results. That object should still be pursued in much wider outlying therapeutical fields.

INOCULATION THERAPY. Martin J. Synnott² contributes the results of his laborious inquiry into the clinical question in its various aspects. Hitherto most has been achieved in chronic conditions; but the greater promise of vaccine therapy lies in the "acute" infections with the help of an earlier diagnosis, of a greater experience in dosage, and of a closer control by means of blood tests.

AUTOTHERAPY BY SPUTUM EXTRACT. The cure of subacute bronchitis in a few days and of chronic bronchitis within two weeks was announced by Charles H. Duncan,³ in 1912. L. C. Toney⁴ now writes enthusiastically of the cure of his chronic bronchitis and of severe coughing spells almost every night, lasting up to forty-five minutes. "I mixed one part of sputum with five parts of water and allowed it to stand for twenty-four hours with occasional agitation, and then filtered it, using a Berkefeld filter. I then had Dr. Carl Johnson, of Los Angeles, give me an injection in the lumbar region. I coughed none the night following. The second night I coughed about five minutes. On the third day, I had another injection. I have had four injections altogether, each three days apart. My bronchitis has been cured or aborted, for I now cough none."

Asthma and Bronchotetany. **THE CLINICAL STUDY OF ASTHMA.** B. C. Davies⁵ gives cogent reasons for dealing with asthma as a symptom. Its many varieties, gastric, renal, nasal, laryngeal, thymic, cardiac, nervous, bronchial, etc., may be practically sorted into two general groups as "bronchial" or "cardiac." Nevertheless it is stated by Osler that true asthma is rarely found in diseases of the heart; and that their dyspnea is not an asthmatic paroxysm, because it is of inspiratory instead of expiratory interference.

¹ British Medical Journal, June 14, 1913.

² New York Medical Journal, November 22, 1914.

³ Ibid., December 14 and 21, 1912.

⁴ Ibid., November 1, 1913.

⁵ Journal of American Medical Association, March 28, 1914, p. 1006.

Asthma has no *constituent pathology* of its own; and yet that ill-defined quantity has been imported second-hand into the pathology of emphysema, bronchitis, and dilatation of the right heart. Its *occurrence* is paroxysmal and painless, stamping it at once as a neurosis. It is characterized by spasm of the bronchi and of the respiratory muscles, including also the diaphragm. And this is followed by a vasomotor disturbance in the mucous membrane of the bronchi, large and small.

There are three theories as to the mechanism of asthma: (1) spasm of the circular muscular fibers of the bronchial wall; (2) hyperemia of the mucous membrane of the bronchioles; (3) spasm of the diaphragm. The first is best supported by evidence as "causal," and the second and third as "consequential." What is it that produces the bronchiolar spasm? The nearest answer is that it is a reflex from an irritation produced elsewhere in the body.

On the strength of his observations in the cases which he narrates or refers to, Davies suggests that the consideration of asthma as a disease be dropped and its presence taken to be a symptom reflex. We should spare a little time, between attacks and also during the paroxysm, to study and examine the sufferers in a thorough way, after obtaining a full record of their histories from the date of their birth. The treatment often lies in preventing the attacks; and this is largely in the hands of the patients themselves.

BRONCHOTETANY IN ADULTS. In connection with this recent¹ clinical heading, H. Curschmann² fully indorses the conception of spasm in the adult as well as in children; and he recalls his early recognition of a train of symptoms of vasosympathetic disturbance, with signs of tetany, including sometimes Chvostek's sign, in isolated cases of infantile bronchial asthma. He had described that syndrome as an "intermittent Basedow-asthma." It occurs also in adults, as in his patient, aged thirty-two years, a farmer, subject for three years to violent attacks of asthma accompanied with various symptoms of tetany. He resorted, with complete success, to his trusted remedy for these conditions, calcium therapy, "a corrective for toxic tissue metabolism." One gram of calcium lactate three times daily put an end to the syndrome. Epinephrin, lauded for asthma, is probably contra-indicated in bronchotetany which, he suspects, may be due to overstimulation of the parathyroid secretion, rather than as probably in simple asthma, to that of the thyroid.

ADRENALIN IN ASTHMA has been thoroughly tried by E. Meulen-gracht³ in 5 cases, with more satisfactory results than from any other

¹ Journal of American Medical Association, 1913, lxi, 1336.

² Münch. med. Woch., February 10, 1914.

³ Ug. f. Laeger., November 20, 1913; cf. Journal American Medical Association, February 7, 1914.

method. The amount injected was half a Pravaz syringeful of the 1 to 1000 solution (0.0005 gm).

Relief never failed to result, howsoever frequent the injections (in 1 case 1500 were administered in nine months). His experience shows that while the drug is neither cumulative nor apt to lose its effect by constant repetition, it does not possess any controlling power over the causation of the affection. Nevertheless, he recommends its use for the sake of its constant efficacy both in giving symptomatic relief and in checking the onset of a threatening paroxysm.

SMALL ADRENALIN DOSES FOR ASTHMA. Arthur F. Hertz's¹ own original experience, that of an immediate relief of breathing at the cost of a severe, almost syncopal, depression after his first injection of 3 minims only of the 1 to 1000 solution—has taught him never to inject himself with more than 2 minims, rarely with more than 1 minim, and, for slight attacks, only $\frac{1}{2}$ minim. This gives entire satisfaction, which is also generally confirmed by other patients. He believes that the usual doses are much greater than necessary, and undesirable.

WHOOPIING COUGH.

The Diagnosis of Whooping Cough by the Complement-deviation Test. This preliminary note is dated by Alfred Friedländer and E. A. Wagner² from the laboratory of the Cincinnati Hospital. It states that they have succeeded in making the diagnosis of whooping cough in all stages—catarrhal, paroxysmal, and convalescent—by means of the complement-deviation test; although most recent authorities had declared this to be impossible. Commenting on those failures, Bordet himself says, "I repeat that that power (of fixing the complement) is *not* seen early. In general, it does not show itself markedly till towards the period of convalescence or cure." Netter and Weil have reached practically the same conclusion. They find that the test is constantly positive by the end of the second week of the paroxysmal stage. In the catarrhal stage, they were unable to obtain a positive reaction. Of 16 cases examined during the first week of the whoop, not one gave a positive reaction. They, therefore, conclude that the test has no diagnostic value in the early stages.

It is a matter of experience that the success of vaccine therapy depends in large measure on the time of its application. The earlier the vaccine is given, the better the results. If it were possible to diagnose whooping cough in the catarrhal stage surely and definitely, its rapid cure would seem assured. After describing their technique, they call attention to the following details: (1) The antigen must be fresh. In each instance they used seventy-two hour growths on ascitic fluid agar. (2) They

¹ British Medical Journal, May 2, 1914.

² Journal of American Medical Association, 1914, p. 1008.

have invariably used active antigen. (3) They have always used fresh active serum. Every case examined in the paroxysmal stage has given a positive reaction. In no case was there a positive reaction when the patient had not had either a pertussis infection or a history of pertussis within four years.

Early Local Treatment of Pertussis in infants and children, by painting the throat daily at first, or every other day, with a 2 per cent. silver nitrate solution, in addition to the irrigation of hydrogen dioxide ($\frac{1}{2}$ to 1 per cent.), is strongly advocated by Oehsenius,¹ who has had excellent results in 84 out of 95 cases; the severity of the spasms rapidly subsided, and the cough gradually assumed the normal type. Its failures were confined to instances of the exudative diathesis. Roux² rightly condemns excessive antispasmodic medication; but something more is needed than the expectorant treatment which he recommends.

The Need of Hospitals for Whooping Cough in New York and other great cities is wisely urged by Godfrey R. Pisek.³

Adrenalin for Whooping Cough has been successfully used by Mulas⁴ in 15 cases (mostly under five years of age), in small, three-hourly doses of 2 to 4 minims of a 1 to 1000 dilution, without any bad effects or relapses. The symptoms were much relieved; and a cure obtained on an average in two weeks, perhaps by diuretic elimination, possibly by checking microbial growth.

Adrenalin Arrested an Intractable Hiccough, in a case of renal colic, which had been treated in vain for eight days by Ségat,⁵ of Jerusalem, by means of gastric lavage with silver nitrate, and of general chloroform anesthesia. A dose of 10 drops of the 1 to 1000 solution immediately slowed the hiccough, and a second dose completely stopped it.

THE TREATMENT OF EMPHYSEMA.

Many physicians do not hope or attempt to restore the emphysematous lung tissues to the normal. Their treatment is purely palliative and precautionary, by climate, medicine, and diet; thus entirely neglecting the mechanical indication which is the only curative.

Essential Emphysema may be the development of a primary, constitutional, inheritable bias—a disease of “elastic malnutrition” in general, or perhaps only pulmonary. More often it is viewed as merely a secondary *mechanical result*, either of “elastic disuse” on the assumption that there can be such a thing as a primary chondral rigidity of the thorax,

¹ Ther. d. Geg., November, 1913.

² Prov. méd., March, 1913.

³ New York Medical Journal, May 16, 1914.

⁴ Gazz. d. Osp., October 16, 1913.

⁵ Jour. des Prat., August 23, 1913.

or, more plausibly, of "elastic overuse" in an unusually exercised and therefore mobile thorax, such as that of all professional blowers. On that view, none of them should escape; yet some do, nay, many do even in a higher percentage, according to some statistics, than in the bronchitic group, which is of pulmonary, rather than thoracic, and of morbid, rather than functional, derivation. Our etiology is still theoretical. Our first solid "anatomical" fact, in spite of many individual inconsistencies, is that the central lobules have an equable mutual lateral support on all sides; and the surface lobules, which are the first to suffer, on one side only, their other side depending for its support upon the parietes. The bony or cartilaginous parietes may be trusted to maintain it; but the muscular might fail to do so. The most uncertain factor is muscle; not only as regards individual endurance for fatigue, but, also, probably still more, in the individual muscular technique of breathing which is so variable among singers, and likely to vary quite as much among blowers. A perfectly correct vocal technique strengthens the lung in all its parts, instead of weakening it; likewise, probably, a perfect blowing technique, provided it is free from external congestive obstructions, such, for instance, as the tight collar and tunic of military bandmen.

If the opposing theories could thus be reduced to a common factor, which is mechanical, this would be our second reliable lead, though still partly inferential. On that basis, for our treatment, we are committed exclusively to the mechanical principle, so long as we remain in ignorance of any kind of "nutritional tonic" for elastic dystrophy, whether primary or acquired. Our medical treatment by drugs or climate is, and can only be, indirectly preventive by preventing bronchitis. All direct treatment for emphysema is *mechanical*, whether intrapulmonary—respiratory by plus or minus of air pressure (neither of which are very effective); or *plastic thoracic* by operation (Freund), this being highly effective but drastic; or, finally, *respiratory thoracic* by external pressure. This has long been tried, but hitherto with much disappointment. It is upon this that our attention is once more concentrated.

The mechanical aim, needless to say, is to restore expiratory adequacy. An immediate attainment is confined to the surgical method; this, therefore, contains, though it may disguise, the solution. Freund attacks the thoracic apex, and cuts it down to the reduced capabilities of the overstretched elastic fiber. At the same time, he mobilizes the pulmonary apex, enabling it to expire; and, as it proves, also to inspire. The question is how to secure mobilization without mutilation. It is essential to note that the apex which he liberates is the least mobile of all; both least accessible and least amenable to any lateral pressure methods. These inevitably, therefore, tend to drive in more air where air needs most to be released. They need not all be fully described; but they have all aimed at a maximum expiratory result by forcible,

and therefore necessarily intermittent, means, and even by ropes and pulleys (Willocks). This led me to study a milder treatment which might be continuous, and to devise an "elastic respiratory jacket" in which the tensions of the elastic sides could be varied, for rest or exercise and for respiratory comfort, by working the straps and buckles in front. The idea was to combine an endurable expiratory pressure favoring a reduction of the thorax in all its parts, with a constant stimulus to inspiration, in the attempt to reëducate the respiratory function. In some cases, it proved remarkably beneficial.

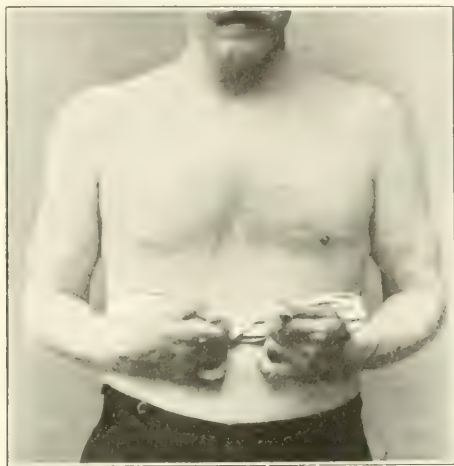


FIG. 19.—Applying the towel over the free ribs; its left end held in the right hand.

A more successful method, on the old lines of forcible, rigid, and intermittent pressure applications, has recently been published by E. Kingscote,¹ of London, after demonstration in New York, under the heading of "Selected Breathing Exercises for the Reproduction of the Chest Excursion and the Restoration of Lung Elasticity in Emphysema and Allied Conditions." This novel idea is based upon two principles: (1) to force the upper ribs to descend, by an extreme expiratory and compressive descent of the thoracic base; and (2) to force the pulmonary apex to breathe, by reversing within it during that rigid compression the process which had led to the progressive atelectasis of healthy and still expandable alveoli by progressive squeezing pressure from the diseased and ever-enlarging surrounding alveoli and bullæ. In short, he reduces and mobilizes the apex by temporarily paralyzing the base in extreme expiration. He attacks the base, instead of the apex as in the surgical method. The result is likewise immediate, though limited to the duration of the sitting, with increasing permanent benefit from

¹ Twenty-third Meeting of American Electrical Therapeutic Association, September, 2 and 4, 1913.

its repetitions. He reports that similar benefit has been obtained in many cases of phthisis. His technique, as shown in Figs. 19, 20, 21, is simple.

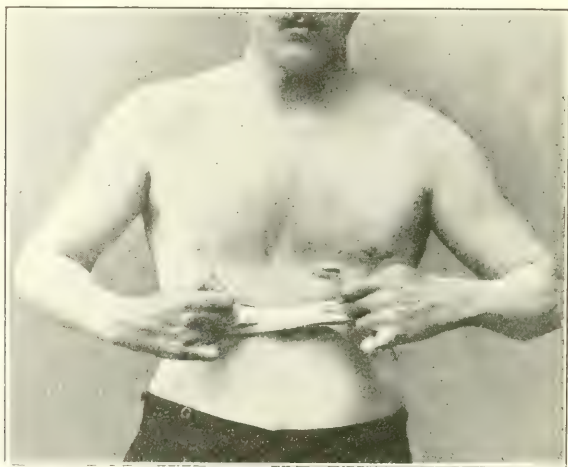


FIG. 20.—Drawing the towel tight while exhaling the subsidiary air through the mouth.

The patient, holding in front the two ends of a long towel passing round the back, is told to expire forcibly, and in that attitude to cross and pull them with all his strength before tying them. I have found a belt of inelastic stuff, provided with three or four straps and buckles, to

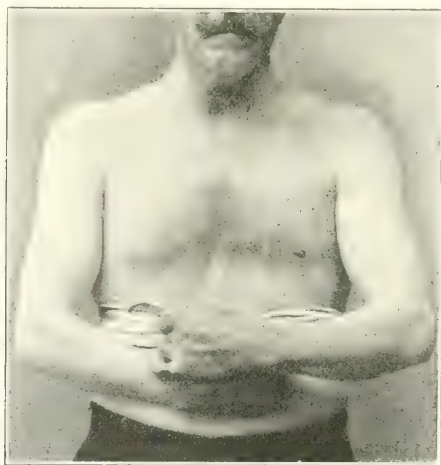


FIG. 21.—Fixing the towel, in full expiration, by crossing the hands, and inhaling forcibly through the nose.

be a more convenient means of applying the pressure. These exercises he says should be performed at least three times in succession on three

occasions in the day; that is to say, nine times in all—not, of course, immediately after a meal. By these means, an increase in the chest excursion from one-quarter to one-half inch per week should be obtained. It is inadvisable to perform these exercises too frequently, as, if the disused air vesicles are brought into action too rapidly, an undesirable cough is apt to be established, "owing to Nature's efforts to disperse débris."

THE ORGANS OF CIRCULATION.

Carrel's Heart Experiments. In his historical papers on "The Technique of Intrathoracic Operations" and "Experimental Operations on the Orifices of the Heart," Alexis Carrel wished it understood that his attempts, begun in 1913, to find a safe technique for a plastic surgery of the aortic and pulmonary orifices had not yet progressed beyond an experimental stage in dogs; and that his results were not yet applicable to man; some of them might never be, others only perhaps after many years. The arrest of the circulation, previously performed in various ways by others, had been obtained by clamping the pedicle of the heart *en masse* with Doyen's forceps guarded by india-rubber, through an incision into the pericardium, for a maximum duration of two to three minutes; pulsation returning and gradually becoming quite regular after their removal, without any accident or the need for massage. That time was sufficient to expose both sets of valves through an incision of 4 cm. into both vessels at their junction. The unavoidable entrance of air into the ventricles was not, on the right side, a matter of much concern, as the resulting air emboli were small and not dangerous in the lungs. But the air in the left ventricle, which is a serious danger, had to be aspirated out of it, by means of a hollow needle. With that precaution, several kinds of operations had been performed. The sigmoid valves of the aorta had been exposed and cauterized. The pulmonary orifice had been cut open, after the wall had been patched with a piece of the vessel preserved in cold storage. The sigmoid valve and the pulmonary orifice had been exposed and sutured. The purpose was to ascertain what could be done in cases of inflammation, stenosis, or dilatation.

The *risks* lie mainly in two directions: (1) the dangers to life, and (2) the general and local results. The first proved to be surmountable. In eight experimental operations performed on the pulmonary orifice, one of the dogs died of a septic and avoidable pericarditis, another on the table from fibrillar contraction; the others (operated upon in October and November) were still alive and normal in April. This indicated a possibility for more complicated procedures; and a hope that by degrees a way might be found to relieve human sufferers, and perhaps to cauterize and repair lesions of their valves as easily as this had been done in dogs.

Some Successful Heart Surgery was described on the same occasion¹ by Prof. R. Proust, of Paris, in a case of pistol shot. The pericardium was emptied of clot, and of the bullet, and the heart wound was closed by four deep and some superficial sutures.

Vividiffusion is the latest brilliant addition to experimental biology. J. J. Abel, L. G. Rowntree, and B. B. Turner² have contributed not only a new method, but, with it, the first of the many experimental applications which may be anticipated from it. The principle, in contrast with that of *visceral ecsomatic segregation* by means of an artificial circulation, is a temporary ecsomatosis of a fraction of the arterial circulation, along an extra circuit inserted into one of the peripheral arteries, to circulate its blood outside the body at will, and back again into a vein.

The dynamics of the circulation may never perhaps allow the "entire" blood supply to be successfully ecsomatized in that way, though Carrel's heart clamping might now render the experiment possible, by enabling perhaps the extra circuit to be inserted at the root of the aorta, and back into it.

This great step in experimental *segregative bioanalysis*, if we may use that general term in contradistinction to experimental *biosynthesis* which has so long attempted to build up life by building up a living cell, is thus a possible introduction to a direct manipulation of the blood stream; to a possible blending of two circulations into a single one, worked by two hearts; and to a possible complete exchange, between two animals, of their entire blood, and of healthy, for diseased, blood.

The *purpose* aimed at by the investigators was not however any such, still visionary, dynamic control over an ecsomatic blood stream, but a chemical manipulation of the ecsomatized blood in transit, by means of simple dialysis. Their method was devised with that view. Essentially, it consists in connecting an artery by a cannula to a series of tubes made of celloidin or other suitable dialyzing membrane and immersed in a saline solution or artificial serum, and in returning the blood into a vein, within a minute or two during which the diffusible substances which it contains can pass out, more or less rapidly, through the walls of the tubes. The products of diffusion can be withdrawn and examined at will. In one instance, an anesthetized dog was kept alive during a dialyzing period of sixteen hours, with about one-third of its blood outside the body.

The *capabilities* of the method are, in the first place, applicable to the experimental study of the general metabolism of the body through its diffusible products, and also of the local metabolism of individual organs, in particular of the ductless glands. Moreover, it provides

¹ New York Medical Journal, May 9, 1914.

² Cf. for references, Journal of American Medical Association, February 7, 1914.

a means for accumulating in any desired amount the elusive non-protein nitrogenous constituents of the blood other than urea. On the other hand, it opens up a promising outlook for our hematotherapy, in the direction of an elimination of some of the toxic substances which hitherto have failed to be eliminated to a sufficient extent or rapidly enough for the saving of life.

Isolated Viscera as an Experimental Pharmacological Field. The dawning of this promise deserves a passing mention. R. Glenard¹ uses isolated rabbit's intestine, perfused with Locke's fluid, for the study of various remedial agents. The motility, no longer inhibited, is greater; but most purgatives take effect upon the automaton, whether ingested or circulated. He finds that magnesium sulphate tends to paralyze the bowel.

Pericardial Affections. ADHESIVE PERICARDITIS. We are indebted to an excellent abstract in the *Journal of the American Medical Association* for the following statements from I. Holmgren's exhaustive review of the subject.² Synechia seems to be comparatively rare in pulmonary tuberculosis, having been found in a few of a series of hundreds of necropsies at a sanatorium. Out of 20 cases diagnosed, it was verified in 9; while in other cases simple adhesion was found where no symptoms had been registered. In one instance, a massive adhesion welded together the base of the heart, the diaphragm, and the liver. The physical signs are fully described. Finsen, who suffered from chronic adhesive pericarditis and ascites, felt better on a salt-free diet, the dropsy returning whenever he took salt.

SALICYLIC IONIZATION was resorted to by J. S. Mackintosh³ on the second day of an acute rheumatic, intercurrent pericarditis in a girl of eighteen years, who was under treatment by aspirin. At the end of the first sitting (repeated on subsequent days), the orthopnea ceased, and she got her first sleep in recumbency. One electrode was placed on the back; the other, soaked in 2 per cent. sodium salicylate, over the precordium. This treatment was suggested by the benefit experienced in arthritis and in some forms of pleurisy. The current of 40 milliamperes, kept up for about half an hour, gave almost immediate and growing relief. The signs of pericarditis subsided steadily.

A Valuable Skiagram re "Dilatation or Effusion?" is contributed by Samuel G. Ehrenreich⁴ in illustration of his case of auricular fibrillation in a girl of nine years, which is in every clinical aspect of great importance and such as to justify perhaps the presumption of a comment. Is it possible, the clinical sequel of the case might perhaps show, that this great enlargement which almost spans the thorax might have been

¹ Arch. des Mal. de l'App. Dig., February, 1914.

² Hygiea, Stockholm, March 1, 1914.

³ British Medical Journal, November 8, 1913.

⁴ New York Medical Journal, February 7, 1914.

due to a double event, an undoubtedly permanent and temporarily aggravated bilateral dilatation, and a transient, chiefly right-sided, pericardial effusion? This might explain the severity, as well as the recovery, noted in the recurrent attacks. We should not, however, leave unmentioned an alternative possibility, that of a "major dilatation" of the left auricle, which, in some rare cases, works to the front, as in Sir Isambard Owen's historical case from which my further studies, and that designation, were derived.

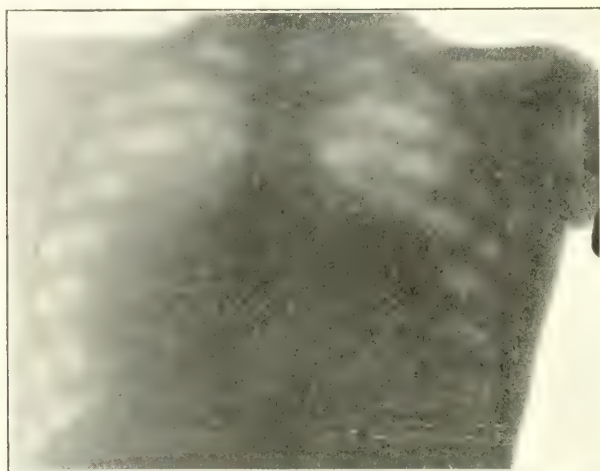


FIG. 22. —Showing marked enlargement of both sides of the heart, comparatively greater to the right.

I called attention, many years ago, to the frequent occurrence of **latent transient pericardial effusions**, in cardiac, in renal, but, most commonly, in rheumatic cases; and to the risk of attributing to cardiac dilatation the increased dulness to which they give rise. So long as they remain unheeded, unsought for, and undiagnosed, the anatomical foundation of the doctrine of a primary incidence of the acute rheumatic mischief upon the heart, namely, of an initial carditis, further defined as a "myocarditis," is unreliable in its basal facts. Recently, the subacute and chronic rheumatic affection of muscles has been described, no longer as a myositis, but as a "fibrositis." This brings us back, in pathological theory, to a consideration of the analogy, long recognized, but practically neglected, between our mobile articulations and the perpetually moving heart-joint; between its serous membranes; between the obviously primary, acute rheumatic arthritic, incidence upon their "lymphatic" fibrous structures, and the acknowledged carditic incidence upon the fibrous valves as chief exponents of the entire fibrous structure of the heart, of which the visceral pericardium is a much more considerable external development; and, therefore,

between the occurrence of the characteristic acute synovial effusions and a probable liability to an increase in the normal pericardial secretion, in further analogy with the serofibrinous increase in the pleura which accompanies pneumonia. These pathological data cannot be disregarded. They point to the clinical necessity for some adequate means of diagnosing those minor effusions.

Their direct identification has not hitherto been achieved so successfully by the *x*-rays as by the older physical signs. The most reliable of these is the dorsal test by means of the pericardial dull patch produced by the postural collection, by gravitation, of the small effusions at the top of the liver. The other test is frontal, Rôtch's sign of the fifth interspace dulness. In connection with this, the skiagram is most instructive. It shows that the fifth interspace must have been dull to percussion. Yet that dulness was interpreted as entirely due to a dilatation of the heart. In itself, Rôtch's sign gives us a true report of dulness, but none as to its derivation. For that reason I have endeavored to elaborate it into a differentiating sign, namely, by two methods: (1) the "outer outline," or "angular" method, based upon the fact that the right auricle is rigidly tethered, close to the middle line, to the *foramen pro vena cava*; and that even under dilatation, its rounded outline works back towards the middle, while that of the effusion slants away from it; and (2) the "thorough," or "through-percussion," method which, in practised hands, is capable of accurately tracing the closely underlying solid dulness of the heart within the boundary of the fluid dulness. That differentiation is also within the competency of skiagraphy, provided there be *enough* fluid, and that it be *collected* anteriorly by the sitting posture.

With these preliminary remarks, looking again at the skiagram, we almost perceive (with due reservation for any alterations due to the printer's reprinting) the dark outline of the right cardiac border, from the aorta to the hepatic level, though its lower third is blurred; and an accessory shadow which diverges from it very clearly above, very clearly too close to the liver, with a separate outline entirely foreign to that of a normal or dilated heart. If not due to pulmonary consolidation, or to a growth, or to an encysted pleural collection, is it not due to the most probable of all occurrences, that of a pericardial effusion? Turning to the left border we recognize at once the clean outline of a dilated heart; the inference being that the fluid was excluded by adhesions from the left side of the pericardium. The axis of the aortic shadow shows no displacement. Yet, if a right-sided effusion did exist, the rather humped aspect of the upper, left border might be explained as partly due to lateral pressure leftwards; and, if so, the right cardiac border, imperfectly displayed by the *x*-rays, might have been traced by a differentiating percussion to a latitude much less distant from the sternum than the skiagram leaves us to guess.

Pericardial Skialogy has received little attention, though much can be learned from screening and from rapid exposures (under $\frac{1}{500}$ second). The instantaneous skiagram obtained by Spéder¹ with Dessauer's flash-apparatus ($\frac{1}{2000}$ second) from a distance of 1 metre, has repeatedly provided him with a first-rate picture of the heart, well outlined *within a large effusion*, contrary to the scepticism expressed by some experts as to the possibility of any such achievement.

The Heart's Action. ELEMENTARY DATA IN ELECTROCARDIOGRAPHY. LEADS AND WAVES. In the body, at rest, the chief electromotive happening is the heart beat. Hence the possibility of using the heart as a battery for a current to be conducted by the body to two extreme points, and outside it through a wire; and by means of this through a delicate current, measurer and magnifying graphic recorder, a *galvanometer*. Each normal heart will give its own record, never quite the same as others, but with general normal characteristics. The pathological estimation of the records is a highly technical matter, ill-suited for these pages. But the method itself is of interest to the entire profession; yet unintelligible to many without the help of a lucid presentation of its elementary essentials such as that contributed by Harold E. B. Pardee² from which short abstracts and illustrations are borrowed.

The Recording Mechanism is constructed on the principle of the reciprocal influences between an electric current and a magnet. In this case the magnet is stationary; but the fine filament which conducts the current between its poles is able to bend towards one or the other of them according to the intensity and the direction of the flash-like heart-beat current. The degree of that excursion is photographically recorded (together with a time record) by Einthoven's String Galvanometer.

The Electric Mechanism consists in establishing a circuit for that cardiac electric discharge, through the body and any two limbs as good conductors, through the water in which hand and foot, or hand and hand are immersed, and through the wire connecting those two baths. It matters much which two limbs are used. As seen in Fig. 23, if the two hands are immersed, the shortest route through the body will be along the "horizontal" line *RA-LA*. That is called Lead I; and in this the right arm is "basal" and the left arm "apical." The galvanometer will record an *upward movement* whenever the current passing through it flows from the apical towards the basal extremity, and *vice versa*. The *left leg* being always the one to be used, the other two leads are: The "oblique" line *RA-L*, from right arm to left leg; this is Lead II, in which the right arm is "basal" and the left leg "apical"; and the "left lateral" line from the left arm into the left leg. That is Lead III, in which the left arm is "basal" and the left leg "apical."

¹ Arch. d'El. méd., January 10, 1914.

² Journal of American Medical Association, April 25, 1914.

By appending a Roman numeral to the latter symbolizing any particular electromotive wave, such as *R*, we can specify in which of the leads the observation was made, namely, *Ri*, *Rii*, or *Riii*.

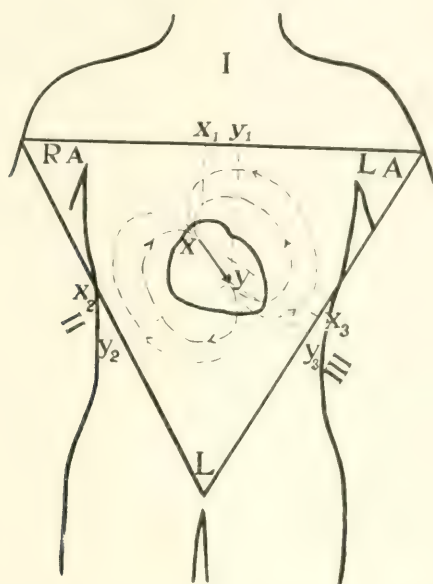


FIG. 23.—RA, right arm; LA, left arm; L, left leg. The Roman numerals outside of the triangle designate the number of the lead to which the respective sides correspond.

The Relation of Each Lead to the Heart and to each of its four electromotive units is shown diagrammatically in Fig. 23, where an equilateral triangle is constructed of the three leads, and has the heart represented at its centre. For instance, the left-lateral lead is nearest to the apical surface of the left ventricle, and has a current value X_3-Y_3 which differs from the others.

The Normal Waves have been named by Einthoven *P*, *Q*, *R*, *S*, and *T* (Fig. 24). *P*, the small blunt *auricular wave*, rarely sinking below the abscissa (unless it should, as sometimes happens in normal subjects, strike downwards instead of upwards), is seen to be amplest in Lead II. The following *interval* (of 0.12 to 0.18 second, not exceeding normally 0.20) shows no perceptible electric effect. A tendency to heart-block would prolong it. The wave group *Q R S* is *initial ventricular*, and it is followed by a characteristic slow rise to the *late summit*.

Clinical interest centres in the great uprise, *R*. We learn, from its minute negative phase at *Q*, and its rapid and deep drop down to *S*, where a third reversal in current direction raises the flashing line into connection with the slow steady rise to *T*, that the galvanometric tracing is merely a resultant, the mathematical heart-sum of the many

contractile potentials rapidly spreading at that initial stage through the myocardium in their well-appointed order which baffles our analysis; and that the predominance of massive conjunctions between the local potentials of the same denomination is of exceedingly brief duration, in both the electric phases. The rapidity of that interplay between local currents of opposing direction affords less hope for further investigation than the late phase. The slowness of the unchequered rise to *T* agrees with the visible duration of the tonic stage of ventricular contraction. Electrically, it has been interpreted as due to the growing

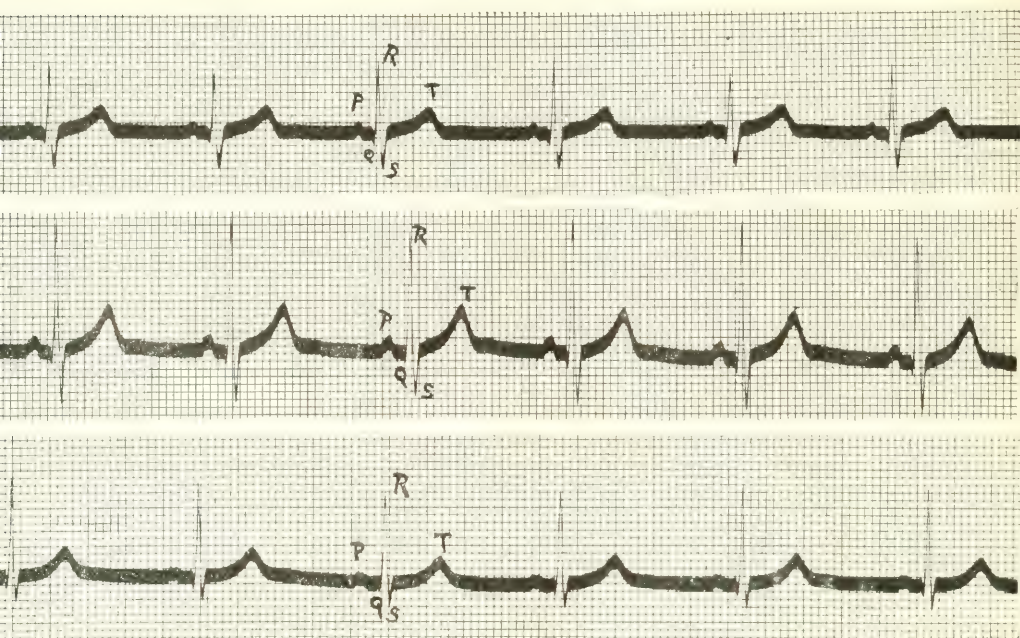


FIG. 24.—Electrocardiogram from a normal person, a member of the Columbia University cross-country team. In this and in all succeeding records one division of abscissæ represents 0.04 second and of ordinates 0.01 volt. In the originals these divisions are actual millimeters.

decrease of the potential at the apex as this begins to relax. It is worth noting that the final relaxation of the ventricle, after *T*, is a much slower and less eventful process than its spastic contraction, although the subsidence of the wave is materially less gradual than its rise. The return to the zero line is now due to the absence of any currents, unlike that after *S*, which was due to a temporary balance between opposing potentials. In Lead III, the *T* wave is sometimes directed downwards in healthy subjects.

The Study of Pathological Cardiograms involves further explanations which should be read in the original. But to give some idea of the

morbid deformations of the tracings we may reproduce Fig. 25, which combines several of them as indicated in the legend.

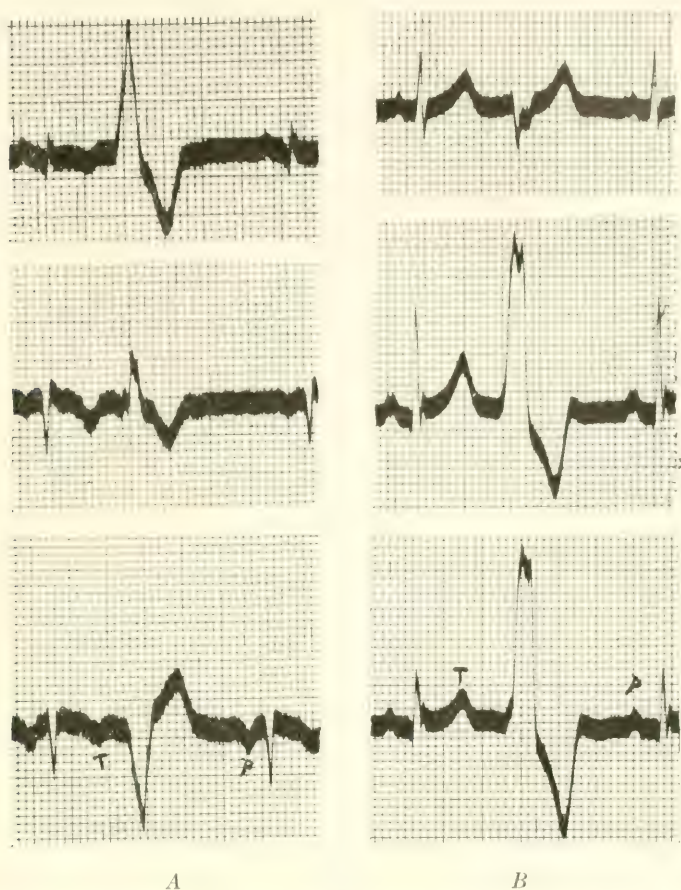


FIG. 25.—*A*, premature ventricular contractions originating in the right ventricle; the complexes of the normal contractions are of normal form; from a patient complaining of frequent attacks of palpitation but with no valvular lesion. *B*, premature ventricular contractions originating in the left ventricle; the complexes of the normal contractions indicate left hypertrophy; this case was clinically similar to that in Fig. 25, *A*; cardiac dulness, though, was enlarged to the left.

Among the conclusions appended to Pardee's valuable paper we note the following: "Certain changes, as pericarditis or endocarditis, will not affect the electrocardiogram until they have existed for a long enough time to affect the function or structure of the heart muscle. Other changes, as hypertrophy, premature contractions and fibrillation, are shown more clearly and exactly by this than by the older methods; and still other changes, those resulting from myocardial disease, are shown exclusively by electrocardiographic records.

"The electrocardiograph should be used in all cases in which there is any doubt as to the cardiac diagnosis, and its routine use will undoubtedly lead to an increase in our knowledge of the effect on the heart action of the various abnormal influences which arise in pathologic physiology."

Heart Reflexes. THE OCULOCARDIAC REFLEX, first introduced to notice by Wagner von Jauregg as a powerful stimulus to muscular contraction and to consciousness in stupor, has already received considerable clinical attention. B. Aschner, in 1908, found that, in the rabbit, the reaction was almost entirely on the respiration, whereas in man and the dog it was almost entirely circulatory. Miloslavich found it often present in health, and constantly in hypervagotonic patients, in digestive neuroses, and in organic lesions of the alimentary tract. Loeper and Mougeot, extending those clinical studies, have concluded that in gastric neuroses there are two types—the "vagotonic," and the "sympathicotonic," which may, however, sometimes combine. Milian and Gautrelet have studied the reflex in exophthalmic goitre, and Petzetakis has found it positive in "nervous" bradycardia. A concise summing up is given by an editorial.¹

The reflex is present in 60 per cent. of normal persons, giving a cardiac slowing of from six to eight beats in a minute. The reflex is normal in the paradoxical tachycardia of arterial hypertension, and in cases of bradycardia of nervous origin. It is marked in hypervagotonic patients, excessive in exophthalmic goitre and in some cases of tuberculosis, syphilis, and articular rheumatism. It is commonly lost in tabes, especially when the Argyll-Robertson pupillary phenomenon is present. The oculocardiac phenomenon appears to be a true trigemino-vagus reflex, and possibly, in exceptional cases, ocular compression may give a trigemino-sympathetic response. Finally, the application of the oculocardiac reflex appears to be free from danger and, for the most part, not seriously painful or unpleasant.

Coupled with the well-known cardiac reflexes centering in the internal ear, the physiological significance of this additional proof of the intimate working connection between heart, special sense organs, and psyche is great.

THE AURAL REFLEX, AND BATHING FATALITIES. The *Medicinische Klinik* for 1913 contains two practical papers on this important subject by Güttick (November 16), and by O. Muck (December 21), which bring to one's mind the desirability of an official medical "bathing certificate," as to individual fitness in general, and also in this particular aural respect. A competent examination would at any rate be the means of warning those whose tympanum is perforated of their unavoidable risks, which can at least be mitigated by plugging the ear with cotton-

¹ British Medical Journal, 1914, vol. i, p. 930.

wool. They dwell specially upon the well-known internal ear temperature reflex which is the most probable explanation for "sudden death" in cases such as those which they discuss in contrast with "asphyxial drowning."

Heart Tests. HEART-TESTING METHODS are still the subject of much divergence in opinion. W. Hofmann¹ advocates Katzenstein's procedure of a two and one-half minutes' digital compression of both femorals, preceded and followed by careful readings of pulse rate and pressure, which he contends is not harmful or trying, as alleged, as a preliminary to severe operations. In cardiac adequacy, the rate should not go up, and the pressure should not go down. J. Kahn,² from an experience of 50 cases, trusts to V. Waldvogel's simpler, and, he thinks, reliable method of reading the systolic pressure in recumbency, and afterwards in standing. C. G. Kemp³ believes in the practical test of the amount of physical work carried on by the subject under daily avocations, rather than in any tests such as Graupner's.

Kemp's paper deals mainly with *Heart Prognosis in Acute Rheumatic Fever*. From a considerable number of examinations, he has arrived at the following percentages: 23 per cent., of all ages, escape through one or more attacks without any clinical cardiac signs. Signs of carditis in the acute stage disappear during convalescence in 22 per cent. In 18 to 20 per cent. of those whose signs do not clear up before discharge, there is no permanent valvular lesion, the murmurs being due to temporary disablement from myocarditis or valvulitis. If the joints can recover, why not the valves? In 14.5 per cent. of severe endocarditis, the murmurs change or disappear, probably by the subsidence of an associated dilatation. Cases of ultimate complete recovery usually show definite improvement within the first year.

COUGH-DILATATION TIME AS A MEASURE OF HEART FUNCTION. James Burney Guthrie's⁴ preliminary note proposes a new test. The healthy heart dilates on coughing to a degree which is visible under x-rays, but not appreciable by percussion. A weak heart will dilate, to an extent readily appreciable to a fine percussion of the right border, after three coughs, or after a single horn-blowing effort with closed mouth. The carefully timed duration of that dilatation (momentary in health, but lasting five or even fifteen minutes in disease), together with its degree, will enable any proficient percussor to form some estimate of the extent of the cardiac weakness.

THE CARDIAC ENERGY INDEX is calculated by Joseph H. Barach,⁵ on a thorough plausible basis, from the *cardiovascular energy*, as indicated

¹ Arch. f. klin. Chir., March 24, 1914.

² Deutsch. Arch. f. klin. Med., February, 1914.

³ Quarterly Journal of Medicine, April, 1914.

⁴ Journal of American Medical Association, January 3, 1914.

⁵ Ibid., February 14, 1914.

by the arterial pressure per minute, analyzed by auditory observations. For that energy he proposes the formula S.D.R.; namely, pulse rate, and systolic and diastolic pressure. That simple method, which he finds is novel in spite of its obviousness, is a valuable addition to our heart-testing resources.

Cardiac Remedies and Treatment. THE TREATMENT OF ACUTE ENDOCARDITIS, as reflected in recent papers, such as J. Phillips¹ and G. M. Swift,² fails still in any hopeful suggestions other than symptomatic; particularly in the malignant type. It is noteworthy that no reference is made to *iodine*, which I believe should be the first, because the most promising resort. The same applies to the heart treatment and prophylaxis in articular rheumatism, where L. A. Conner³ advocates, when indicated, an appeal to *intravenous* salicylate injections, having successfully administered 130 of them in 12 cases.

THE INTRAVENOUS TREATMENT OF RHEUMATIC FEVER has been practised with striking success at the Metropolitan Hospital in 28 acute and several subacute cases, including one of gout and one of gonorrheal arthritis, by Paul M. Patterson,⁴ with McDuffie's mixture modified to equal parts of the three ingredients, namely, 41.29 grams of sodium salicylate, of guaiacol and of glycerin in 2000 c.c. of distilled water. Of this 75 c.c., together with 125 c.c. of normal saline at 100° F., are slowly injected without any discomfort, except sometimes giddiness or sleepiness towards the finish, and, in 1 case, slight delirium. The guaiacol is included to obviate the otherwise inevitable vertigo, tinnitus, and dyspnea; while it also raises the HB percentage by 5 to 25 per cent. Profuse perspiration sets in within half to one hour later, continuing from four to ten hours; and ushers in general amelioration. Further details are given in the original. As nothing at present known equals the rapidity of the relief, this method would command general attention if we could be informed that it safeguards the heart.

STROPHANTHUS BY INHALATION. For the direct medicinal treatment of the cardiopulmonary system, the bronchial route is a third alternative to the subcutaneous and to the intravenous methods. Drug inhalation was recognized and recommended several years ago as an excellent, but neglected, therapeutical opportunity. Space forbids our dwelling upon its obvious merits in the varied urgencies of our bronchial and cardiac affections. There is, with it, no dilution of the dose with those larger bulks of venous blood which makes either for the inferior or the superior vena cava. The dose is accurately placed between the right and the left ventricle, with the best chance of influencing the latter, and, to some extent, the former also. The delays of its bronchial absorption are also a practical economy, as compared with the rapid

¹ Ohio State Medical Journal, January, 1914.

² Medical Record, February 21, 1914.

⁴ New York Medical Journal, November 1, 1913.

³ Ibid.

transit of any dose committed to the general circulation; this insures a larger measure of continuity in its local action, whether pulmonary or cardiac. These essential advantages, among others, are strikingly illustrated by J. Moczulski's clinical experience of the superior value of inhalations of the tincture of strophanthus for rapid cardiac relief. It also demonstrates the fact that any technical improvement in administration must go to raise that value, and to promote the wide adoption of a method which possesses every rational recommendation. He availed himself, in the 5 successful cases which he reports,¹ of the advances recently published by Theodor Heryng in connection with a thermo-accumulator for gases and a thermoregulator for fluids. The practical result was the achievement of major effects from minimal doses (10 minims only, dissolved in 30 c.c. of distilled water, daily), namely, considerable diuresis, diminished edema and cyanosis, and rise in blood pressure, the heart's action often benefiting surprisingly even from the first inhalation, beyond the slower progress registered, after ten days of a thorough treatment by exclusive milk and strophanthus and digitalis by the mouth. The diuresis rose and fell by large amounts with the administrations or the suspensions of the inhalations. In one instance, a man aged sixty-three, was so alarmed at its violence after one of the inhalations that he refused to continue them.

THE TREATMENT OF HEART-BLOCK, AND STOKES-ADAMS SYNDROME. Varied agencies may interfere with the transmission of stimuli besides atheroma of the bundle of His. An editorial in the *New York Medical Journal* (November 15, 1913) reminds us that digitalis is also capable of setting up a block, yet hardly equal to removing it. Nevertheless, it is held to be of great benefit in Stokes-Adams syndrome. This alone would establish a distinction, such as Lewis insists upon, between the two conditions: they are not synonymous terms. The Stokes-Adams syndrome, besides the slow pulse, the vertigo, and the loss of consciousness of heart-block, includes epileptoid attacks and visible auricular pulsation of the cervical veins.

In *simple heart-block*, then, we should avoid digitalis, and trust to atropine to counteract the block by paralyzing the vagal terminals. For suspected syphilis, mercury or the iodides should be tried, the salicylates for rheumatic cases, the iodides for arteriosclerosis, etc. Overexertion and violent emotion are dangerous. In the syndrome, on the other hand, the myocardium seems to demand additional tone. This is best met by the addition of strychnine. But, in some cases, particularly when there is dilatation, digitalis in moderate doses, or a good fluidextract of cactus grandiflorus, in 30-drop doses, as advised by Wilcox, is to be preferred. Sodium citrate and iodide have been found beneficial by some observers. Saline solution, intravenous or

¹ Wien. med. Woch., January 8, 1914.

subcutem, but without any epinephrin, which would aggravate the block, might aid the threatening cases by a diminished viscosity and an enhanced osmosis of the blood.

RECOVERY FROM BRADYCARDIA, at sixty-eight years, after two years of auriculoventricular dissociation and of the usual symptoms of lesion of the bundle of His, was the result of the adoption by Carles and Camuyt¹ of a prolonged but successful antisypilitic treatment, although the Wassermann reaction (consisting in an abnormal fixation of the blood-serum complement, whereby the normal hemolysis no longer occurs) was negative, as it sometimes is in tabes, general paralysis, and other syphilitic affections of the nervous system which may be still active and still responsive to treatment. Their remarkable case conveys a double lesson, of faith in cardiac curability, and of diagnostic all-round open mind.

BLOOD STORAGE THERAPY. J. Tornai,² of Budapest, is prosecuting, with increasing success, his mechanical bloodless method of intermittent cardiac depletion and relief by holding up the venous blood traffic in the limbs for about an hour, morning and afternoon. He has improved his technique by means of suitable broad bands with automatic U-shaped buckles, for the simultaneous constriction of the four limbs.

THINNING TREATMENT BY ELECTRIC MUSCULAR STIMULATION. Otto Simmonds³ gives an account of the method and apparatus of Bergonié, of Bordeaux. The sittings of twenty to forty minutes are spent on a couch provided with suitable electrodes to throw into contractions (120 per minute) the various muscles throughout the trunk and limbs by means of rhythmic interruptions of a low-tension faradic current. The loss of weight (1200 to 1500 grams per week), due to a quickened metabolism, is favored by moderate restrictions in diet on the usual approved plan for the reduction of obesity. The method is clearly of wide-ranging value, and in particular for pulmonary, for cardiac, and for cardio-pulmonary sufferers.

THE PREPERICARDIAL THORACECTOMY AND PERICARDIOLYSIS successfully practised in a bedridden woman, aged twenty-four years, with chronic cardiac symptoms, by Delangénière,⁴ was a more extensive operation than that which had hitherto been performed ("thirty-eight times in all"), by mere resection of 6 to 9 cm. of the third, fourth, and fifth ribs without any sternal interference, except in Thorburn's case. Under chloroform, a large flap was raised from first left sternocostal articulation across to second right; then down the right side of the sternum to the seventh right sternocostal junction, then transversely across base of the xiphoid to 7 cm. to the left of the middle line. The

¹ Jour. de méd. de Bordeaux, December 28, 1913.

² Wien. klin. Woch., March 5, 1914.

³ Med. Klin., January 18, 1914.

⁴ Arch. Prov. de Chir., June, 1913.

piece of sternum and ribs lying below was removed. The excised portion of sternum was 14 cm. long, and had pieces of four ribs on each side attached. The patient left the hospital two months later, and remained well, permanently wearing a cotton-wool pad over the gap. When seen again after two years she was working regularly as a charwoman.

Venesection and Transfusion. THE PRESENT POSITION OF VENESECTON; AND TYPHOID FEVER. R. D. Rudolf¹ records 12 typical cases selected as examples from 127 cases of typhoid, in which bleeding occurred, at the Toronto Hospital. In one of them, the bleeding was through venesection. The hemorrhages were followed by a marked transient fall in the temperature and pulse-rate, which often lasted for days, or even ushered in convalescence. Bleeding undoubtedly produces a profound effect upon the economy, increasing the flow of urine and the intake of oxygen, with proportionate raising of tissue oxidation. Moreover, the coagulation time is hastened, and the specific antibodies are increased, the agglutinating power of the blood being enormously raised. By the timely use of venesection in those cases which are not doing well because of the severity of the toxemia, the good effects of hemorrhage might be obtained, with avoidance of the risks associated with intestinal hemorrhage; and, theoretically, a moderate venesection of from 6 to 14 oz. can do no harm, and may possibly be productive of great good.

It has long been observed that even considerable hemorrhages are more often productive of alarm than disaster, and that the temporary setback is often followed by perceptible improvement. A case seen in consultation some years ago strikingly confirmed my good opinion of the influence of spontaneous blood relief. The young man was probably at the end of his second week less favorable than the first for my systematic treatment by an initial dose of castor oil, and subsequently small non-purgative daily doses of $\bar{5}j$ to $\bar{5}iss$ or $\bar{5}ij$, which cannot at so early a date possibly address themselves to any ulceration. A very profuse hemorrhage occurred on the day of the initial dose, but I did not share the dismay of the friends and of the attendant. The patient did remarkably well under the usual "whey" treatment (Prideaux Selby) and my own "residueless nutritious diet," with small daily cleansing doses of oil, which were started again after a short interval. This *empty-bowel treatment* I can strongly recommend as not only rational, but singularly effective. But more than this is needed.

The Abortive Treatment of Typhoid. Upward of ten years ago, I began the study of the *abortive treatment of typhoid*; it was unfortunately interrupted by the lack of hospital material, owing to the growing suppression of the disease in London, and to its concentration in special

¹ American Journal of Medical Sciences, January, 1914; and Canadian Medical Association Journal, April, 1914.

fever hospitals; and it has never been published. I still look hopefully to its resumption on the same lines by others. "*Immediate inception*," prior to "diagnosis," postulates some form of active treatment which should be absolutely harmless, and yet positively beneficial, whether the case declares itself eventually typhoid, appendicitis, or what not. The nutritious empty-bowel and castor-oil treatment is of that order. Have we any other, either sounder, safer, or better?

But what of the local lesion, strictly identified to the valve? Knowing its site, shall we watch and wait for the evolution of its ulceration, with its broad-cast infectiveness? As soon as the blood test clinches the diagnosis, it is up to us to apply continuous or periodical daily "direct treatment" by antiseptic lavage. This would be at the cost of an appendicostomy, which would be surgically and medically justifiable at the early stage in a patient already much improved by that simple initial treatment. In the original (not typhoid) case which was operated at my request by Sir William Bennett and published, I demonstrated and practised the daily catheterization of the valve, and the lavage of the lower ileum. That practical method may belong to the future; personally, I trust it may be found superfluous. But even so, during that expectant interval of eight days or more, when we suspect that a bacillary colony is in progress at the valve, engorging its circulation, its lymphatics, and its glands, are we justified, at this resourceful period, in studying inertia rather than endeavor?

The first thought is to keep an empty and sanitary bowel; the second, though hardly short of "primary" in importance and earliness, to deobstruct the vessels and lymphatics. In that lead my practical study of "abortion" went so far as the adoption as a prime principle, not of "general" venesection—why general?—but of local leeching, most harmless, most comforting, and presumably most beneficial; and I carried it out in 3 cases; the last I had under treatment before the instance above narrated. The suspended investigation remains where it was left. My all-important question is still unsolved, whether it is best, both for incipient typhoid and for all appendicitis (for which I recommend the same principle), to trust to our beneficial experience of the "regional method," that of leeching the seat of pain and tenderness or to prefer the "circulatory method," by tapping the hemorrhoidal system at its inferior end at the anus. That question should not be allowed to slumber. The main excuse for including it in this report is that its general publication has long been intended, but never carried out. It is true that I did not fail, at the news of the last Toronto epidemic, to write with the boldness of a life-saving purpose, to the Public Health Authority, suggesting a trial of the treatment described if some better cure were not already in hand; but I have not heard whether that message was ever received or acted upon.

A CONVENIENT BLOOD-LETTING APPARATUS FOR INFANTS, simple and easily sterilizable, has been devised by Elliott C. Burrows. The skin of the scapular region having been rendered aseptic, is punctured six to ten times with a broad Hagedorn needle; the cup is then applied, and exhausted by the suction pump.

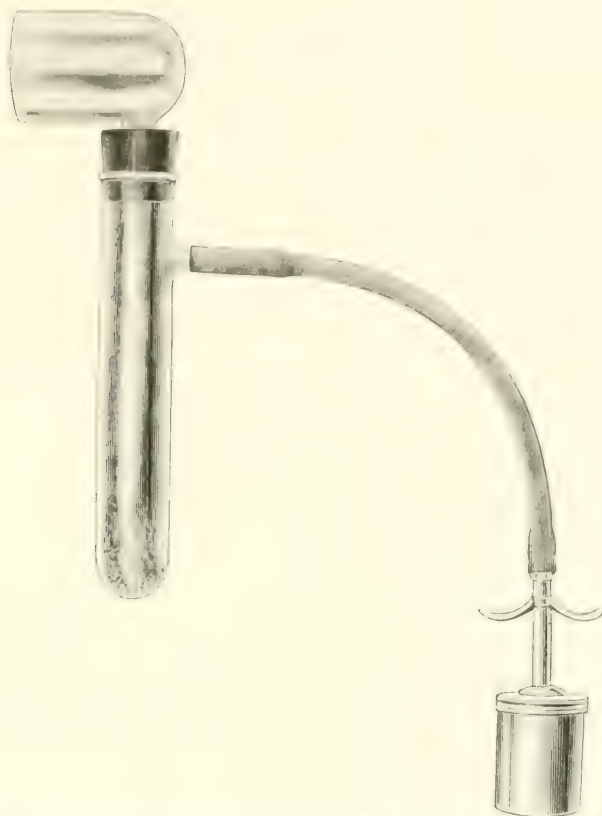


FIG. 26. — Blood-letting apparatus, showing the glass cup which is placed against the patient's back, and a part of the glass tube for receiving the blood, and of the tube leading to a suction pump.

DIRECT TRANSFUSION. It is stated by Bernheim¹ that ten months previously V. C. Vaughan, Jr., had reported having proved, in the case of a newborn infant, the possibility of transfusion through a simple hypodermic syringe without any clotting, with the judicious help of saline solution mixed with the blood. The apparatus constructed by Freund, of Detroit, consists of two needles for the two veins, two rubber tubes for a two-way stopcock, and, attached to this stopcock, a glass tube with a container for normal saline. It has enabled him to trans-

¹ Journal of American Medical Association, July 26, 1913.

fuse 150 c.c. without detaching the needles. Into the syringe is drawn 1 c.c. of saline. It is next filled with blood from the donor, which is then forced into the recipient vein by closing the first stopcock and opening the other.

Guillot and Dehelly,¹ of Le Havre, give their experience of 19 cases of direct transfusion of blood. Their technique of vascular anastomosis is by means of Elsberg's cannula.

A VEIN-TO-VEIN TRANSFUSION FORCEPS has been devised by Bernard F. McGrath,² so simple that the figures explain it. It is an application of Soresi's principle of "cuffing" the vessels.

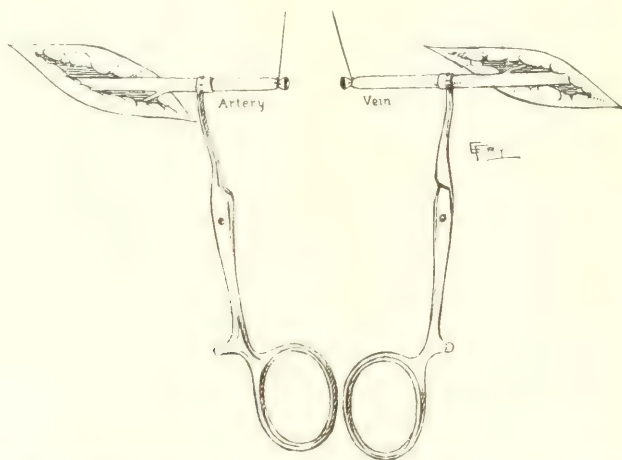


FIG. 27. -Vessels drawn through cannula by means of ends of ligatures.

The intima of the donor is applied to the intima of the recipient in a direct line, with no foreign substance at the point of union; and only the slightest locking of the forceps is necessary to prevent leakage.

INTRAMUSCULAR DIRECT TRANSFUSION is given special prominence by W. Weiland³ in his review of "The Principles and Technique of Organotherapy." This is a novel use of the method of "whole-blood" immediate transfusion. In the usual vein-to-vein process, we dilute the charge by the entire mass and by the universal distribution of the recipient's blood. Using the single tuber with terminal needles, he conveys 20 c.c. of the healthy blood from the ulnar vein, by means of the distal needle into the gluteal muscle. He has found this method to be of great service in pernicious and secondary anemias; and he invites for it the widest trial. As a probable explanation for the good

¹ Arch. Prov. de Chir., September, 1913.

² Journal of American Medical Association, January 3, 1914.

³ Therap. Monats., April, 1914.

effects, he suggests that it may *inter alia* act as a stimulus to the bone marrow.

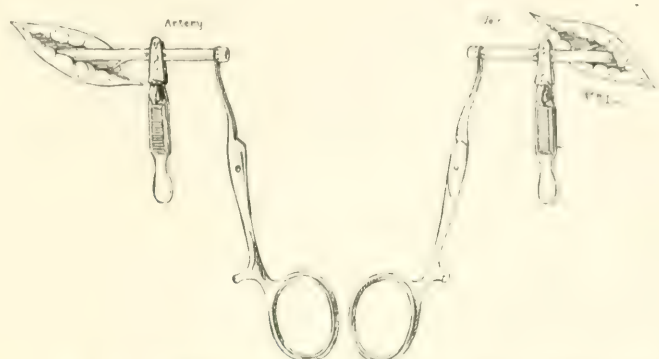


FIG. 28. Vessels cuffed on cannula and fixed on sharp hooks.

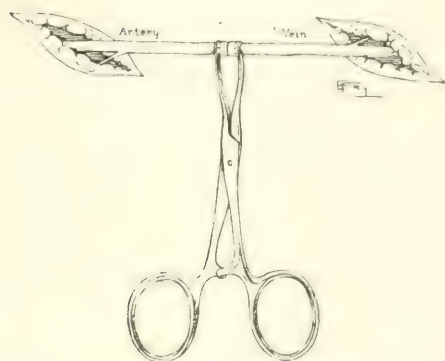


FIG. 29.—Forceps lightly clamped after allowing blood to flow from cannula.

TRANSFUSION BY MEANS OF GLASS CYLINDERS is described by A. R. Kimpton and J. Howard Brown¹ as a simple expedient needing no trained assistance, provided the operator is himself familiar with bloodvessel technique, and easier than vein-to-vein anastomosis. A tourniquet is applied on the upper arm of the donor only tight enough to give venous congestion. Under cocaine, a superficial vein just below the elbow is exposed through a one and one-half inch incision. This is tied off proximally, and a Crile clamp applied distally. A similar vein is exposed in the recipient's arm, tied off distally, and a Crile clamp applied proximally. With a cataract knife, a slit is made in the vein of the recipient, and a similar one in the vein of the donor. The clamp being opened, the cannula of a 250 c.c. cylinder is inserted. This cylinder fills in less than two minutes. When filled, the cannula is withdrawn and the

¹ Journal of American Medical Association, July 12 and November 7, 1914.

clamp closed. The clamp on the veins of the patient is now immediately opened, the cannula of the cylinder inserted and the cylinder emptied. A second cylinder (100 c.c.) is next filled from the same opening in the donor's vein and emptied into the same opening in the vein of the recipient. Two or more large cylinders could be used if desired. An almost identical method has also been published by others independently.

ANOTHER SIMPLE DIRECT TRANSFUSION METHOD is that of Vernon E. David and Arthur H. Curtis,¹ of Chicago, first published in 1911, and now republished,² with their recent experiences.

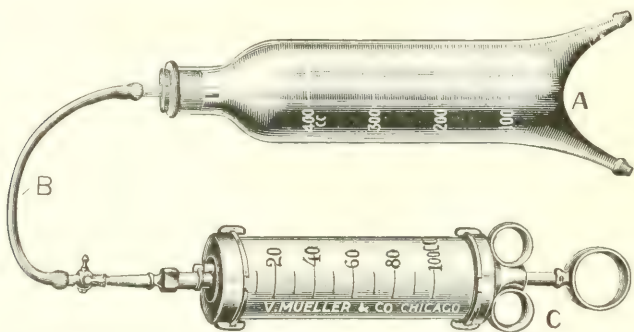


FIG. 30. Apparatus for blood transfusion. Blood enters only the paraffin-coated bulb, A, the cannula tips of which fit into the veins of donor and recipient. The rubber tube, B, and syringe, C, are used to exert positive and negative pressure.

H. S. Satterlee and R. S. Hooker's³ method and apparatus seem to be practically the same as those above described.

A VASCULAR SUTURE, obviously not desirable if avoidable, may become necessary if the vessels are too small to be stretched over the cannula. For this purpose, and for vascular surgery in general, McGrath⁴ has further devised the appliances shown in the illustration.

BLOODVESSEL ANASTOMOSIS can also be effected by E. S. Muir's⁵ method. He inserts, with the help of fine instruments, a delicate tube of sterilized bone as a connection, and leaves it in, to be completely absorbed within three or four weeks.

The Severe Anemias and their Treatment. THE DANGER OF PENETRATING RAYS FOR THE BLOOD-FORMING ORGANS. In rabbits and guinea-pigs H. Heineke⁶ reports destructive changes in the lymphocytic foci from one hour's transabdominal exposure to 20 mg. of radium; and marked destruction of nuclei after only five seconds of a direct intra-abdominal

¹ Journal of American Medical Association, January 7, 1914.

² Ibid., March 7, 1914.

³ Archives of Internal Medicine, January, 1914.

⁴ Journal of American Medical Association, April 25, 1914.

⁵ Journal-Lancet, Minnesota, April 15, 1914.

⁶ Münch. med. Woch., December 2, 1913.

contact with the spleen or intestine. A thickness of lead of 3 mm. afforded no material protection. He therefore sounds a note of caution as to the clinical use of radio-active substances and of the *x*-rays; and refers to the 6 recorded cases of leukemia in radiologists. The blood should be kept under careful observation during any such treatment.

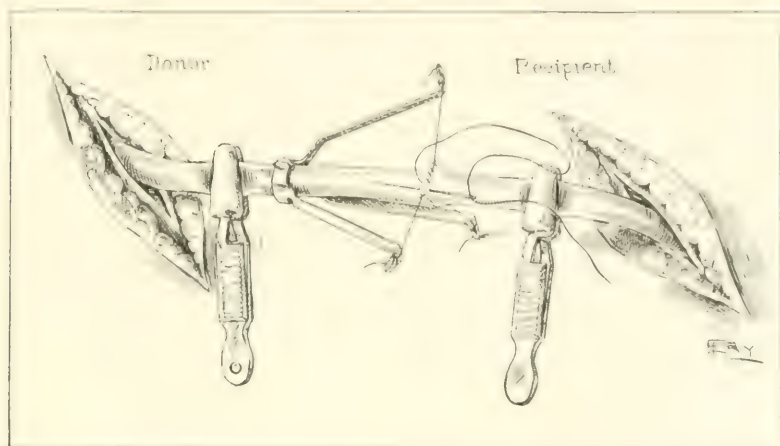


FIG. 31.—Instrument for vascular suture in transfusion as used in anastomosing the vessels. Particularly in transfusion, strong silk may be employed for the stays, the suture being made with the usual fine material for this purpose. Human hair is a very good substitute for the latter in case of emergency.

INDUCED PHOTO-ACTIVITY OF SERUM. Unknown therapeutic possibilities are opened up by this latest development. S. Wermel¹ finds that horse serum exposed to the *x*-rays causes the same cutaneous and leukocytic reactions in animals as their direct application.

SPLENECTOMY; ITS INDICATIONS AND ITS RESULTS, are reviewed by G. Klemperer.² In pernicious anemia, within less than a year from its earliest performance, he has 10 cases of splenectomy to report, with one actual cure, and great improvement in the others, though the blood characteristics have persisted. This is striking evidence of the curative value of the operation, even when performed on a normal-sized spleen. Anemias and cachexias with enlarged spleen can be benefited in Banti's disease, in hemolytic jaundice, and in cases of new growth, or of a tuberculous process in the spleen. But splenectomy does no good, but rather harm, in malaria, syphilis, lymphosarcoma, leukemia, granuloma, and in amyloid and congested spleens.

For *Pernicious Anemia*, Byron Bramwell³ still trusts to arsenic after its long trial as the most reliable, though too often temporary,

¹ Münch. med. Woch., February 10, 1914.

² Th. d. Gegen., January, 1914.

³ British Medical Journal, May 24, 1913.

remedy; beginning with 2 minims after the three meals and adding an extra drop every fourth or fifth day up to a maximum, (10 to 12; or sometimes 16 to 20), to be kept up for several weeks. The individual tolerance can be extended by addition up to a grain of morphine to the dose. Neuritis sometimes supervenes; but the vital indication warrants that risk. Since October, 1910, he has treated 11 cases with salvarsan, with, on the whole, very beneficial effects.

II. Hirschfeld's¹ estimate of the value of arsenic agrees with that of Bramwell. It should be resumed at any threatening of a relapse; and if it fails, iron might prove useful. Transfusion has achieved some relief, but never a cure. The continued administration of hydrochloric acid and pepsin is essential.

Benzol in Leukemia has given encouraging results, but demands extreme caution to avoid a fatal degree of leukocytic destruction. The best effects are probably attainable from combining with it α -ray or radium treatment of the glands, if they give rise to pressure symptoms. Their removal is no cure for the systemic trouble. Splenectomy in myeloid leukemia is fatal; the only case that survived showed no perceptible effect upon the disease.

CHRONIC SPLENIC ANEMIA AND BANTI'S DISEASE. H. D. Rolleston's² article claims that the diagnosis of "Banti's disease" should be restricted to hepatic cirrhosis when this follows upon a chronic splenic anemia. The latter is characterized by splenic, without any glandular, enlargement; by chlorotic anemia with leucopenia; by recurrent hemorrhages; and by a chronic course without any spontaneous recovery. Splenectomy, when successful, is usually curative. The "first" of its three stages is preascitic and splenomegalic (three to five years or longer). The "transitional" stage shows leukopenia with mononuclear predominance, with chlorotic anemia, and usually with some icterus and liver enlargement, and perhaps intercurrent diarrhea or piles (twelve to eighteen months). The "fully developed" stage brings on ascites with a shrinking cirrhotic liver, general failure and wasting, and hemorrhages, as in ordinary cirrhosis (a few months only). Splenectomy is then the only chance, but its fatality is greater than in simple splenic anemia.

SECONDARY OR SYMPTOMATIC LEUKEMIA. According to Gordon R. Ward,³ it might be as well to imitate the distinction between the anemias which has long been practised and accepted, and to refer to what is ordinarily called leukemia as "primary leukemia," the etiology of which is still unknown; while other forms, which can be definitely traced to some traumatic or morbid etiological agency, might be specified as "secondary or symptomatic." He instances as belonging to that secondary group, the three varieties which have been described as

¹ Med. Klin., January 11, 1914.

² Practitioner, April, 1914.

³ Lancet, May 23, 1914.

arising respectively from septic processes, from fractures, and from cancer. Primary leukemias may be due to some microorganism which will eventually be identified. Meanwhile no progress is likely to be made with the clinical study of leukemia until subdivisions are established; and for the present the idiopathic varieties would be properly labelled "primary" until their true nature can be made out.

THE PATHOLOGY OF PERNICIOUS ANEMIA DUE TO X-RAYS has been studied by Cavazzeni and Minelli¹ in the body of a radiologist, their colleague, who succumbed to profound essential anemia. The lesions on the face and hands were slight. The spleen was of small size and somewhat hardened. Both testicles were shrunk to the size of filbert nuts, the parenchyma being soft and of a yellow color. In the medulla of the ribs there was a great scarcity of normoblasts, complete absence of megaloblasts, with a few red globules more or less deformed; megalocytes exceptional, polynuclear leukocytes less than normal; excess of lymphocytes with large nucleus; scarcity of myelocytes, with very rare eosinophile cells. The spleen showed an abundance of globular and pigment cells as evidence of an active blood destruction with fibrosis of the Malpighian follicles, in addition to pronounced atrophy of the epithelial cells of the seminiferous canaliculi. The basal membrane of the canaliculi was enormously thickened by connective tissue, which compressed and destroyed the glandular tissue. The epididymis was also invaded by connective tissue. From this account it will be seen that the local affection was slight and was confined to the left hand and cheek, which were turned toward the tube. Unknown to himself and his colleagues, however, the unfortunate radiographer was being slowly poisoned by the "radiolymph" of his own tissues. The anemia was probably the result of the absorption of the ionization products of the tissues most sensitive to the x -rays, namely, the testicles, the osseous medulla, and the spleen.

THE ETIOLOGY OF PERNICIOUS ANEMIA lies, according to A. Cederberg,² in a parenteral blood contamination, through a permeable intestinal wall (as in some forms of helminthiasis) with the products of protein metabolism. The remedy would consist, he thinks, in a suitable limitation of ingested alien albumin, to obviate the "anaphylaxis-like" operation of a relative excess of it.

ACUTE LEUKEMIA is, according to J. Citron,³ essentially "infective," in those rendered susceptible by a thymolymphatic constitution, or by some analogous liability artificially induced by x -ray influence. The mobilization of the leukocytes is the response to that unknown virus, and the mere attempt to destroy them is futile, except when their increase is such as to be mechanically injurious.

¹ Radiol. Med., February, 1914.

² Berlin. klin. Woch., March 30, 1914.

³ Deutsch. med. Woch., March 26, 1914.

THE SURGICAL CURE FOR GRAVE ANEMIAS is still on the rise. It has recently been extended to pernicious anemia. One of the latest successes of splenectomy is published by F. Port.¹ Three months after removal of a spleen weighing 432 grams, the reds numbered 3,556,000, the whites 9500, with 77 per cent. H.B., in a man of thirty-one years. The feature of our time is the cutting of Gordian knots. Helpless medicine, however reluctant, can only acquiesce. It should turn to the study of that heroic artifice; and not forget that the business of the future still remains to untie them.

The Surgery of the Spleen, including the question of splenectomy, has also been recently reviewed by Michelsson.²

THE SPLEEN IN THE ETIOLOGY OF ANEMIA. Let us first note the valuable physiological teaching from an accidental human experiment. In Kreuter's³ patient, a healthy boy of fifteen years, a hopelessly crushed spleen was removed. After six weeks the blood picture was almost completely normal; and the reactions to injections of adrenalin or pilocarpin were likewise normal. We owe to Turk⁴ an important review of the etiological situation, to which our space cannot allow full justice. Banti's disease is given as an illustration of a toxic activity of the spleen upon the bone marrow without hemolysis; and this is also seen in some splenic tumors, etc. Severe anemia may result from gastro-intestinal congestive hemorrhages, where the spleen is enlarged from pylephlebitis or from the results of umbilical infection at birth. For any such splenectomy would be futile, as there is no toxic damage to the marrow. But in the hemolytic groups, which find an illustration in the varieties of familial hemolytic affections with or without jaundice, where the marrow is overstimulated by an excessive blood destruction in the spleen-liver system, the operation is indicated; and its success clearly identifies the spleen as the evil factor. In Hanot's hepatic cirrhosis, in the absence of anemia, it is likewise a chief contributory as identified by complete cures, such as those reported by Eppinger, after protracted durations even up to ten years. Lastly, in advanced pernicious anemia, in the light of quite recent surgical experience, an immediate remission may be looked for, if not a complete arrest. It is true that in none of the 7 cases he refers to, within the ten months preceding his report, has the blood risen to the normal corpuscular level. But its great improvement points unerringly to the spleen as the main destructive agent.

THE BLOODVESSELS AND ARTERIOSCLEROSIS.

No important fresh departure seems to have been recorded in the pathology or clinics of this subject. As regards

¹ Berlin. klin. Woch., March 16, 1914.

² Zentralbl. f. Chir., January 10, 1914.

³ Ergeb. d. Chir. u. Orthop., Band vi.

⁴ Deutsch. med. Woch., Feb., 1914.

Calcium in the Genesis of Atheroma, Scandola's¹ observations and experiments are, in general, confirmatory of previous work. His main conclusion is that arteriosclerotics retain more calcium than others; and that, on that basis, a diet of milk, eggs, broths, etc., so commonly recommended, is all wrong, as it contains a higher calcium percentage than, for instance, meat, potato, and other constituents of his dietary list. The retained calcium was not eliminated by the administration of sodium iodide, phosphoric acid, or sajodin, the chief drugs with which he experimented.

THE CAUSATION FROM PSYCHIC AND MENTAL OVERSTRESS is interpreted by J. Pawinski² as a reaction upon the nutrition of the vessels from the depression in visceral innervation and metabolism. Doctors are the worst sufferers. In angina it ranks fourth as an etiological factor, namely, after tobacco, obesity, and alcohol; but in woman it ranks second, obesity coming first.

TRUNECEK'S NEW PHYSICAL SIGN³ identifies the rigidity of the aorta by feeling, "between the scaleni," for a systolic sharp shock and bulging of the subclavians at their origin.

THE MEDICINAL TREATMENTS tried by K. Rutkewitsch,⁴ have all proved disappointing. The only help he can foresee is from diet and physiotherapy.

UNDER ELECTRIC TREATMENT, A. Bühler⁵ attributes the rapid pressure reduction (5 to 10 mm. in ten minutes) to myarterial relaxation from electric stimulation of the nerves. The benefit to be derived from a course of this is not always permanent.

The Regeneration of Elastic Fibers in the Arterial Elastica after Injury. This vexed question has been studied experimentally in dogs by Caforio.⁶ The essential factor seemed to be a perviousness, and therefore a continued functional capacity of the artery. Regeneration began after the fourth week, and recovery was complete in four to five months. He cannot state that the new fibers grew from the old, more probably from some elastogenic cells scattered in the cicatrix. The article is valuable for its photomicrographs and its extensive bibliography.

The Reaction of the Coronary Vessels to Poisons. For isolated rabbits' hearts, with Ringer-Locke fluid, N. Kravkoff⁷ has arrived at the conclusion that in the coronaries the predominant nerves are the vasodilators, the vasoconstrictors being supplied exclusively from the vagus. The application of epinephrin tended to dilate them; that of caffeine and theobromin dilated them considerably, more so than is observed

¹ Gazz. d. Ospedali, September 7, 1913.

² Zeits. f. klin. Med., January, 1914.

³ Münch. med. Woch., February 10, 1914.

⁴ Zeits. f. klin. Med., February 14, 1914.

⁵ Med. Klin., January, 1914.

⁶ Riforma Medica, January 17, 1914.

⁷ Russky Vrach., January 4, 1914.

in peripheral vessels. Nicotin, pilocarpin, barium, and histamin caused a constriction, which was less marked than at the periphery.

Perforation of the Aorta by Foreign Bodies, usually from the esophagus, is unfortunately neither so rare as first reported, nor amenable to treatment or, in most cases, to diagnosis, in some cases not even productive of any suspicion of danger. In view of its fatal possibilities, no case of swallowed foreign body is trivial; as a fact, the patient may not even be aware of the occurrence. The practice of holding needles or pins between the lips is a gratuitous risk, and should be discouraged by early tuition at schools. H. Chiari¹ contributes two instances of his own, with some reference to the literature, and some remarks on the pathology of the subject.

Vena Cava. K. A. Wagner² discusses the clinical symptoms, both objective and subjective, of stenosis and obstruction of the superior vena cava in 4 cases of tuberculosis or tumors of the mediastinum.

PULSATION OF THE INFERIOR VENA CAVA. In 3 cases of severe anemia, L. Bard³ has observed and recorded graphically a double undulatory, manifestly venous pulsation, visible in recumbency. In one of them there were three waves, protodiastolic, presystolic, and systolic, occurring 0.04 of a second later than those in the jugular. The tracings were taken by means of an oval aluminum cap, 11 cm. by 5 cm., placed along a line joining the umbilicus with the left femoral rings. He attributes it to an unusual propagation of the auricular aspiration in an imperfectly filled cava with relaxed walls, somewhat analogous to the mechanism of the Corrigan pulse in unfilled arteries.

RUPTURE OF AN ANEURYSM INTO THE SUPERIOR VENA CAVA. A. Klein⁴ reports a case, and has collected records of 17 similar cases. The three important diagnostic features are: A perforation murmur, venous pulsation, and sudden onset of edema and cyanosis limited to the area drained by the superior vena cava. But all these features are not invariably present. The condition does not necessarily terminate fatally at once, and in 1 case the patient lived eight months after the arteriovenous anastomosis had developed.

Wiring and Electrolysis for Aortic Aneurysm. Prof. H. A. Hare⁵ gives a full account of the successful employment of this method in 3 additional cases. It is essential not to use too much current, and to remember that silver wire, because it does not coil, is unsuitable. His further experience is entirely confirmatory of his previous conclusions: (1) No accident has occurred in the twenty-two (now twenty-five) operations he has performed; and, so far as known, this seemingly radical operation

¹ Berl. klin. Woch., January 5, 1914.

² Russky Vrach., February 1, 1914.

³ Semaine méd., March 25, 1914.

⁴ Deutsch. med. Woch., October 9, 1913.

⁵ Journal of American Medical Association, April 18, 1914; cf. also April 13, 1912.

has not proved a dangerous one when properly conducted by others. In one reported case, an attempt to wire a fusiform aneurysm of the carotid artery resulted almost immediately in hemiplegia; and, in another unreported case, the mistake of using the negative pole in the growth loosened the clot already present and caused multiple emboli; (2) the operation is the only one that offers material hope of prolonging life (in 1 case at least for five years); (3) it is justified by the prompt relief of pain which nearly always ensues; and this lasts, unless the growth, extending in another direction, should create a new source of pain; (4) the diagnosis of saccular aneurysm should always be confirmed by Röntgen-ray examination, as this operation is contra-indicated in fusiform aneurysm for obvious reasons; (5) great care is absolutely necessary that properly prepared wire be employed.

The Pulmonary Artery has long eluded physiological, pathological, clinical, and pharmacological investigation. David I. Macht's¹ preliminary note on the "Action of the Nitrites on the Isolated Surviving Pulmonary Artery," describes an attempt in the last of those directions. The experimental esomastic survival method was applied in this case to strips or rings from the medium branches of the pulmonary artery of pigs or oxen. In every experiment the three nitrites and the tetranitrate produced a contraction, or an annular constriction, in complete justification of Rouget and of Francis Hare's treatment for hemoptysis. He was able to confirm this in a human artery from a fresh necropsy, even after many days' preservation in Locke's solution and the ice-safe.

The Physical Diagnosis of Patent Ductus Arteriosus has been discussed by Rosenthal² and by Irving Simons.³ The latter calls attention to a new sign. Frank's sign consists in the audibility of the continuous waxing and waning murmur in the left interscapular space: in Simons's patient this was audible *also in the right*, though less loudly, at about the level of the scapular spine. That bilateral conduction of the murmur along both divisions of the pulmonary artery is *a priori* probable, and should therefore be searched for as an important confirmatory evidence. On the other hand, he could detect no pulsation of the shadow of the pulmonary artery, which Wessler and Bass regard as pathognomonic; but Gerhardt's left paramammary dulness, and the local thrill were present. The patient, aged twenty-one years, presented the characteristic feature of relative fitness for physical exertion.

Blood-pressure. THE SYSTOLIC AND THE DIASTOLIC ESTIMATION. The "systolic" and the "diastolic" pressures hardly need to be explained: the systolic is the total pressure; the diastolic, that which remains after the pulse-wave has passed, while the blood still travels in spite of the resistance. It is the equivalent, or the measure of that

¹ Journal of American Medical Association, February 14, 1914.

² American Journal of Obstetrics, August, 1913.

³ Journal of American Medical Association, January 3, 1914

resistance. They can both be determined by the auditory method. The third important pressure is not recorded by the latter, but is calculated from the systolic pressure by deducting the diastolic. This is the "pulse pressure." It is the measure of the cardiac force which moves the blood and carries it through the circulation. Best revealed to the finger, it cannot be directly determined by the manometer, whereas the other two values are given by the auditory method at any rate approximately.

Concerning the *systolic* estimation, MacWilliam and Mervin¹ have pointed out that the artery sometimes gives a sound at a level far above that which palpation indicates as the level of obliteration. In that particular, the auditory determination of the systolic pressure is not so reliable as that of the diastolic; "it needs to be controlled" by the finger.

The diastolic estimation, which is all essential, is still the subject of some disagreement among experts as to its precise reading. For instance, D. R. Hooker and J. D. Southworth² conclude that the onset of the brachial sound is coincident with the systolic; and the cessation of the sound with the diastolic pressure. While MacWilliam and Mervin are convinced that the point to be taken for the reading of the diastolic pressure is that at which the sound rather suddenly diminishes.

ARTERIAL SPASM. Not least among the experimental uncertainties which obscure our determination of the true blood-pressure is that of the physiological behavior of the myarterium under lateral pressure. The tone, and therefore the elastic resistance, of the arterial wall are variable quantities in different individuals and in different arteries. This has long been pointed out by O. Williamson; and it is recognized by MacWilliam and Mervin, and others, who suggest a preliminary "corrective massage" of the brachial. In high readings, the instrumental estimate cannot discriminate between the resistance of the blood-pressure and that of a spastic wall. We believe, with Williamson, that palpation is the only reliable judge; but it fails to record its verdict. The trained finger, as it palpates the radial, has the great advantage that it can apply a tentative massage, while feeling for its results. This has a special bearing upon the main clinical requirement withheld from us until recently by the instrumental method, namely, a reliable, if approximate, estimate of the diastolic pressure. Meanwhile in tactile sphygmology, my early observations on the systematic use of two or of three fingers on the pulse had provided the means for that information. Nay, a single finger can supply much of it with the help of the technique arrived at. But, in the usual method, the single finger confines itself to the palpation of the pulse-waves and, like the sphygmograph, can only identify their summits.

¹ British Medical Journal, March 28, 1914.

² Arch. Int. Med., March, 1914.

THE POSSIBILITIES IN THE USE OF THE AUSCULTATORY METHOD IN PNEUMONIA are carefully considered by A. Alexander Howell;¹ and he also gives a lucid account of the usual events under auscultatory examination. *The first sound heard* (when after obliteration of the pulse, the mercury is gradually allowed to fall) is a clear-cut tap which indicates the reading of systolic pressure. As the mercury falls, other similar taps are heard. These *in toto* constitute "the first phase." A sudden change from taps to a succession of *murmurs* marks the passage of first into "second phase." The "third phase" is instituted on a reappearance of *clear tapping* sounds; and, as the column of mercury is allowed to gently sink, it gives way to a succession of *dull muffled taps*, "the fourth phase." At the cessation of these sounds, the mercury column continues its fall to the zero mark, unaccompanied by auscultatory phenomena. This absence of sound has been called by some the "fifth phase." According to Warfield, and to Weyssse and Lutz,² the diastolic pressure must be taken as corresponding with the beginning of the fourth phase, and not with the cessation of all sounds. But other observers have taken slightly different estimates. This reveals an inherent difficulty in interpretation, not to be wondered at in view of the experimental complication of the method. As Howell well puts it, "what is needed, for the appreciation of the worth of this method, is its reduction to the simplest terms." The same clearly applies to the procedure by which the auscultatory events are brought about. That is the root question. If the Riva Rocci method should prove to be unreliable, much time might be wasted in studying and speculating upon its auscultatory data.

THE RIVA ROCCI METHOD is still upon trial. Its study has quite recently been extended, shall we say complicated, by two collateral investigations, that of MacWilliam and Melvin upon the behavior of a *schema*; and that of Leonard Hill³ upon the manometric and physical behavior of superficial arteries (in particular of an aberrant radial) under his pocket sphygmometer, and, upon what he thinks to be a fundamental function, thereby revealed after having been hitherto overlooked, and now described by him under the name of "the resonation of the tissues." A further development of his observations has been the recognition of the factor of "lability of the arterial wall." These additions to the influences which modify the readings and their interpretation are too recent to lend themselves to any reliable criticism; but they, as well as the *schema*, impress upon us the need for a careful revision of the fundamental principles of our current clinical method. Some idea of Hill's conception of the "new function" set forth in his joint paper with McQueen and Ingram may be gathered

¹ Journal of American Medical Association, April 18, 1914.

² American Journal of Physiology, December 1, 1913, vol. xxxii, No. 8.

³ Royal Society Transactions, February 2, 1914.

from his remarks upon the fact that simultaneous readings at the femoral and at the carotid give in the femoral a slightly lower diastolic pressure, but a much higher systolic pressure (by say 68 mm. Hg.) than in the carotid: "We would advance this explanation in terms of the resonance theory. The abdomen functionates as a resonator of the pulse, because each organ in it—liver, spleen, kidney, intestines, etc.—are all pulsating, and the cavity is a closed one. Descent of the diaphragm is compensated for by an outward movement of the abdominal wall. The abdominal wall is an elastic structure. Consequently the systolic pulse in the aorta and great vessels is surrounded by more or less synchronous pulsations, which, like a well-adjusted touch to the moving pendulum, augment its swing." Resonance of the tissues must be held, he thinks, to play an important part in the transmission of the pulse, and thereby to save the work of the heart.

THE OPTIC ESTIMATION OF BLOOD-PRESSURE. S. Federn¹ has realized that the cuff profoundly modifies the capillary circulation in the limb, while Basch's bulb compresses only one artery. In addition to the radial, he has studied with the latter the nutrient artery of the tibia in its superficial course, and also specially the superior anterior intercostal artery which, owing to its high level, conveys the blood-pressure direct from the upper thoracic aorta, and gives high readings. His novel method enables him to study the local results of arterial obliteration *below the Basch bulb*. He finds that, while obliteration is kept up, a pulsation soon returns, which he attributes to the capillaries. A *straw index* is mounted upon a small disk (5 to 6 mm.) of thin cork or of card paper, which is stuck to the skin at the spot investigated; for instance, anywhere near the course of the obliterated radial artery. While the finger may not feel any pulsation, the index moves appreciably, though a magnifying glass may be needed to watch its pulsation. In that sense this is clearly a delicate method; but it is difficult to gather from his remarks any support for the claim that it is a method of precision. On the contrary, it introduces a fresh problem for study into the complicated theory of our instrumental technique. This reminds us of Leonard Hill's recent contention that local arterial pressure readings are influenced and apt to be raised by an overlooked extra-arterial factor to which he refers as an entirely new function, under the new name of "the resonating function." Practically there does not seem to us to be any novelty in the observation of a tissue pulsation, which is rendered more apparent wheresoever the tissues and capillaries are confined within somewhat resistant envelopes, such as a glandular capsule, or any fascia.

PERCIVAL NICHOLSON'S² POCKET SPHYGMOMANOMETER (MERCURIAL), described and illustrated in his paper, is a distinct advance as regards

¹ Berlin. klin. Woch., March 30, 1914.

² American Journal of Medical Sciences, April, 1914.

portability; and he also claims for it perfect accuracy and suitability for the auditory determination of pressures. That mechanical advantage is gained by the simple device of folding the scale, and of carrying the long manometer tube in two adjustable halves, in a safe metallic box which can be slipped into the pocket of an overcoat.

HYPOTENSION. Hypotension in Association with a Definite Symptomatology. Headache, vertigo, mental and physical overfatigue were common to the 5 cases of low-pressure described by Edward H. Goodman.¹ Subjectively they were alike. But what of the etiology? He confesses that he does not yet fully understand its mechanism. He agrees with Edgecombe that it is difficult to raise the pressure much or permanently; that a small rise coincides with a great amelioration; and that exercise, diet, and climate (high altitude) are preferable to drugs. Yet he would be loth to forego the help of strychnine, or of the tincture of nux vomica, of which he has prescribed up to 75 minims daily. His paper mentions some of the few contributors to a neglected subject, such as Janeway, Cannon, and Münzer who recognize two chief groups, arteriosclerosis and status thymolympathicus. Wiesel, as well as Hedinger later, has described in hypotension a hypoplasia of the chromaffin system; and Schur and Wiesel, its hypertrophy in cases of hypertension. P. B. Cornwall's conclusions to his paper on "Low Blood-pressure"² are also worth consulting.

The Hypotensive Subject has fewer degrees of pressure to spare before he collapses; but he has the great advantage of a long upward scale for recuperation, which also gives him a chance of developing endurance by practice. His aptitudes are kept habitually at half-cock; while the hypertensive steadily uses his best to the full. The *special dangers* attaching to hypotension are splanchnic.

The Coli-cardiac Syndrome. A. Mathieu³ gives a striking illustration of this condition in his case of "réaction colique." The colon reaction syndrome which he describes is induced by the rapid emptying of an overloaded intestine. But we might also describe from experience similar gastric, intestinal, and perhaps pancreatic syndromes.

The "Intestinal" Bradycardias. Apart from the attacks just described which culminate in cerebral anemia and fainting, the wider question opens up as to the morbid cardiac response, as regards rate and rhythm to various forms of visceral irritation. Although bradycardia is less common than tachycardia or arrhythmia as a result of digestive upsets, Maurice Loeper⁴ has often seen it in gastric neuroses and ulcers, especially of the lesser curvature. But the bradycardias are commoner in intestinal affections. They are not merely bradysphygmias, but true

¹ American Journal of Medical Sciences, April, 1914.

² New York Medical Journal, March 7, 1914.

³ Arch. d. l'Appareil Digestif, December, 1914.

⁴ Presse méd., Belge, November 9, 1913.

neurogenic bradycardias, from lesion or irritation of the vagus. That origin suggests some such treatment as valerian 5 gr., and belladonna 2 gr., three or four times daily, with complete rest in bed; or, if necessary, 1 or 2 mg. of atropin, best given under the skin; and locally hot compresses.

In the Neurasthenia of Immigrants, recently described by Siegfried Block¹ as a "New Psychosis," rapidly and completely curable by appropriate treatment in which strong and even punitive suggestion is an essential factor, it is difficult to say whether the conspicuously weak pulse and low blood-pressure are the result or perhaps more probably the cause of the disabling psychasthenia. At any rate, they would suggest a rational indication in the treatment; it would fit either etiology, and it might help to explain this success of the forcible method, usually so disappointing in the main group of the degenerative neurogenic neurasthenias.

Hypotension from Hyperthermia. This derivation has been demonstrated experimentally in lower animals by L. H. Newburg and C. H. Lawrence.² Marked fall in pressure resulted from temperature not exceeding that of an infective pyrexia. In this connection, it might be noted that hypotensive subjects feel the weather most, and that they are more readily overcome by moderate excess of heat than of cold.

PRESSOR AND DEPRESSOR AGENTS. *Hypotensor Pituitary Principles* have been isolated by Houssay and by Claude and Baudouin by their special methods, whereas a preparation of the entire organ, or of its posterior lobe, made by maceration or decoction causes increased arterial tension and slowing, with augmented force, of the heart beats. H. Claude and R. Porak call attention to that contrast. After an intramuscular injection of the Claude-Baudouin preparation for hemoptysis, the pressure fell from 160 to 110 mm., not rising again for three and one-half hours. Nevertheless, there is no apparent loss of the stimulating effect of the whole organ extracts on intestinal peristalsis as well as on the uterus. An extract of pituitary from which the lipoids have been removed with chloroform will produce glycosuria, but its vasoconstrictor and diuretic effects appear less marked than with the total extract. The practical conclusion is that separate pituitary preparations should be used for different purposes.

Digitalis and Blood-pressure. The fundamental fact in the blood-pressure effect escaped us for want of efficient clinical methods of diastolic observation. In disease, the systolic behavior varies with the dose as well as the individual. Contradictory teachings have bewildered the student, such as that of the verified, yet paradoxical, benefit in aortic reflux, or the more daring ventures urged by Fiessinger in angina, and by Riesmann in hypertensive cardiac hypertrophy. The digitalis

¹ New York Medical Journal, May 23, 1914.

² Archives of Internal Medicine, February 14, 1914.

result in disease is constant in one thing only; it invariably *lowers the diastolic pressure*. This was first realized by Martinet in 1912; and he¹ is now able to confirm his own earlier observations, and those since made by others. According to his experience, an existence systolic hypertension is not to be held, as hitherto impressed, to be a primary contra-indication. The ruling indication is to ease the struggling heart of its diastolic overpressure. Concurrently with the effect, the oncometer has reported a dilatation of the renal vessels, as a more plausible explanation for the diuresis than the still prevalent theory that this is the work of an increased "pulse pressure." Nay, as a by-effect, some perceptible reduction of the "systolic pressure" itself may be associated with those benefits. He avers that, by judicious dosage, it is possible, in a large proportion of cases, to mitigate the latter. This would be confirmatory of our clinical belief in a radical distinction between the stimulating operations of strophanthus and those of digitalis, the one more spastic, the other more tonic. But to insure those digitalis advantages, its attenuation is essential. The dose of the French "digit-alin," said to be mainly if not wholly digitoxin, should be reduced to $\frac{1}{10}$, up to $\frac{1}{4}$ of a milligram ($\frac{1}{600}$ to $\frac{1}{240}$ of a grain); that of "digalen" to 15 drops. With those doses we might confidently approach the treatment of angina, on the intermittent plan of ten days' course, with intervals of ten or twenty days. In that way he has been able, in 10 cases, to relieve remarkably the urgent symptoms; while reducing the diastolic pressure, and finally, in some of them, the systolic as well. This was also true of his cases of cardiorenal sclerosis, where the resting interval could be shortened to four days; and of his cases of aortic incompetence, where very small doses were administered continuously for prolonged periods with excellent results.

The Tobacco Blood-pressure Question, ever present and ever urgent, cannot be fully discussed for want of space. H. John² has identified, even after the smoking of two medium cigars, only a characteristic rise in diastolic pressure which may last two hours, due to a constrictor stimulus special to nicotine. A brief review of the larger question is given in an editorial,³ which should be consulted.

The Senile Presentments of Disease. H. Schlesinger⁴ calls attention to the modifications which old age impresses upon various diseases, common to all ages. Former infections may leave more or less immunity. Not so streptococci, pneumococci, and influenza and colon bacilli; they leave extra susceptibility rather than immunity. In the elderly, the general symptoms are severe, while the local symptoms are extraordinarily mild or lacking. The inelastic lung tissue, the

¹ Presse méd., April 22, 1914.

² Zeits. f. exp. Path. u. Ther., 1913, xiv.

³ Journal of American Medical Association, February 7, 1914.

⁴ Wien. klin. Woch., February 5, 1914.

impaired blood supply, and the way in which some nerve centre may fail early, all tend to obscure them. At no age are there so many latent diseases. We have yet to learn to recognize their special signs. Their course is short; or it may be unusually prolonged. If the elderly survive the onset of angina, they may live long with it. They take long to convalesce from an acute disease, and they are liable to cardiovascular complications any time. The gravest dangers are anorexia and marasmus. He remembers only one recovery from senile anorexia. Its treatment is futile. *The Medical Significance of Old Age* is a wider subject still, to which E. D. Crothers, of New York,¹ devotes some interesting remarks.

¹ Medical Press and Circular, May 20, 1914.

DERMATOLOGY AND SYPHILIS.

By WILLIAM S. GOTTHEIL, M.D.

DERMATOLOGY.

Total Alopecia. Occasionally cases of the kind shown in Fig. 32 come to us for help; and it is well for us to know beforehand the limitations of our powers in that direction, for they are profitable prey to the advertizers and the "Beauty Parlor Doctors," and in many instances have been despoiled for years by the various medical and non-medical humbugs that devote themselves to exploitation of this kind. The least they can get from us is a square deal; and that means, in my opinion, a frank statement of the possibilities of the case.

The instances of complete alopecia, and I mean by this cases in which there is complete absence of hair all over the body, axillary, pubic, and general surface, as well as the scalp and face, come under two categories, both infrequent, fortunately, but one much rarer than the other. In the first are the exceptional cases in which hair never develops on the normally hirsute parts of the body at all, or, if there has been any growth in infancy and childhood, it is extremely sparse, lanugo-like in character, and soon falls out. These are more properly designated as *Atrichia*, or complete absence of hair, and are instances of a developmental abnormality of which we are still in ignorance as to the cause. The hair papillæ have either not developed at all, or they have been present in small numbers and imperfect size, and have gradually atrophied and disappeared. Microscopic examination, and I have made innumerable sections from the scalp in cases of this kind, shows not a trace of the hair follicle or papilla; and it is evident that all attempts at treatment of such a condition are useless.

In the second class come the cases that have begun as an ordinary alopecia areata. The cause of this affection is still entirely unknown; but we do know that there are two distinct types of the affection from the prognostic point of view. They can only be differentiated from one another, however, by observation for a long period. The first type includes the ordinary cases of alopecia areata occurring in childhood and early life, in which the bald patches appear and grow with fair rapidity, get a regrowth of lanugo and then normal hair with equal facility, and may persist, with remissions, for years. Some elderly patients come under this category also. The second type may be called

the malignant alopecia areatas. The increase of the patches is slow, but progressive; if, with or without treatment, there is any hair regrowth at all, it is of the finest lanugo type, and soon falls out again. Alopecia patches appear in the eyebrows, among the axillary, pubic, and general surface hair, and the eyelashes fall out. Gradually the alopecic areas extend and coalesce with one another, until the entire body is denuded of hair, except for lines of remaining hairs that mark the borders of the original patches. Finally, every hair on the body falls out: scalp hair, beard, moustache, eye-brows, eye-lashes, axillary, pubic, and general surface hair, all is lost. In these cases also no trace of hair follicles can be found when they have lasted for some time.



FIG. 32.—Total alopecia. (Gotthell's case.)

I know of no way to differentiate the benign from the malignant cases in their early stages. The prognosis gets worse, however, the older the patient when the malady first breaks out. In a general way, the outlook is good in young individuals with multiform, rapidly advancing bald areas, and bad in older ones of slow progression. The only safe course to pursue is to be guarded in our prognostication in every case. If, in the course of time, we find that the areas show marked tendencies to lanugo regrowth, and get covered up, we may prognosticate cure after a long time, even if new areas appear from time to time. If, however, our therapeutic efforts are unsuccessful, the patch or patches grow in spite of our efforts, if there are few or no signs of a new growth, the prognosis is very doubtful.

Treatment can be dismissed briefly. In the complete congenital alopecias, and in the alopecia areatas that have gone on to complete or almost complete denudation, it is of course hopeless. But where areas or thicker rings of hair are left, there is still hope; and these patients are naturally willing to submit to almost any treatment, no

matter how long or troublesome the disease may be. All our measures resolve themselves into various means of irritating the skin and stimulating its circulation. The high-tension glass-vacuum electrode, the faradic brush, the application of pure carbolic acid, the use of chrysarobin, etc., are all means to that end, and should be employed persistently and variedly as the circumstances seem to require. I usually apply one method daily for two to three weeks, and then use some bland ointment until the irritation has passed away sufficiently to permit of renewed work. And I have finally, after months and years of work, cured some very extensive cases.

The Skin Diseases of Children. Schalek¹ has done well to call special attention to these affections; for generally, in their earlier and more manageable stages at all events, they are under the care of the general practitioner, and sometimes give him no end of trouble. Though in a general way the dermatoses of the young do not differ from the same affections in adults, the symptomatology is affected by the peculiar reactivity of the infantile skin, the concomitant phenomena may differ widely from those seen in older individuals, and the therapeutics has to be adapted to the different conditions that prevail. The dermatological text-books pay but little attention to this rather specialized class of affections; and, in most of them, the entire subject is handled in a rather insufficient and unsatisfactory way.

Skin affections of the acuter type are commoner in children than in adults, in Schalek's opinion; a statement that it would be difficult to prove, but which may well be believed when we remember the great sensitiveness of the infantile skin, and the ignorant care to which the vast majority of the young are necessarily subjected. Uncleanliness, of course, sometimes causes inflammatory trouble of the nature of eczema and dermatitis, and promotes the growth of pus organisms with the secondary results of impetigo and furunculosis. It is doubtful, however, if the opposite extreme is not more often productive of trouble; possibly Hebra was not far wrong when he said long ago that he saw more skin troubles in people who were overactive bathers than in those who were too sparing in their ablutions. There is such a thing as too frequent washing of the skin, especially of the infantile skin; the fat which should normally impregnate the superficial layers of the epidermis is removed too often and too completely; the abnormally dry skin is deprived of an important protective agent; and it does not resist deleterious mechanical, chemical, and microbic agencies as well as it should. Once a day is in my opinion the limit, except under special circumstances, of the frequency with which the infantile skin should be subjected to the use of soap and water; in a good many cases this is too much; and we have all of us seen many cases in which much more

¹ Journal of the American Medical Association, July 19, 1913.

infrequent general ablutions, together with a free use of oil or milk for cleansing purposes, has kept the infantile skin soft, smooth, and perfectly clean. The soap to be used should be unscented and pure; no medicaments should be incorporated in it. It is perhaps not out of place to state here that the so-called "Castile soap," which enjoys an unwarranted reputation among the laity for blandness and purity, is not infrequently made from the very worst refuse materials, and is not a desirable one to use.

The very general failure to find an external or microbic cause for many common skin affections, both in children and in adults, has led dermatologists to turn back again for constitutional, secretory, nutritive or metabolic derangements as etiological factors of importance in them. The ordinary inflammations and infections of the infantile skin, dermatitis, eczema, urticaria, impetigo, ecchyma, furunculosis, etc., are, as we well know, commoner in fat and well-nourished or overnourished children than in those who are not in this condition. Some faulty condition of the food or feeding will almost always be found to be present. The feeding is often irregular or too frequent; and a good many women still have the bad habit of permitting the infant to sleep at the breast at night, and to assume that any restlessness or crying is due to want of food. Often, again, the mother's milk is too rich; in the child's feces will be found not the normal 10 per cent. of unabsorbed fat, but a very much higher percentage. Or the milk may be too concentrated; a matter which it is difficult to regulate if breast feeding only is employed. Sometimes it is absolutely necessary to wean the child, and put it on suitable artificial nourishment. I have always felt that this aspect of the child's case is one that can be better handled by the family physician or by a pediatricist; and I invariably refer them back to one or the other for the regulation of these important matters. With older children, also, ordinary dietary laws are frequently neglected; they are allowed to eat the food provided for the adult members of the family, and to indulge in pickles, sweets, cheese, and other articles entirely unsuitable for them. The precise manner in which dietary faults affect the skin reactions is unknown to us; but the fact that they do is a matter of common observation.

The symptomatology of dermatoses in children differs also in certain respects from that which we are accustomed to see in adults. All the skin reactions are more acute; erythematous, vesicular, bullous and pustular lesions are common where in older individuals we would have papules or infiltrated lesions. The ordinary phenomena of location do not show as in adults; thus scabies may show lesions on the head and face. Even the usual appearance of the characteristic lesions may be changed; thus the urticarial wheal may be red instead of white from compression of the capillaries during its entire course.

Schalek rightly cautions practitioners against the internal administra-

tion of drugs in the dermatoses of childhood. The child's skin is more sensitive and reactive, and it is very liable to drug eruptions. Antipyretics and opiates especially should be avoided. He touches on external treatment only incidentally, and a few observations on that point may be useful.

Bearing in mind the great sensitiveness of the infantile skin, it goes without saying that all external applications should be of the mildest possible character, lest they do more harm than good. A safe rule to follow is not to exceed one-tenth of the adult dosage in our prescriptions. The chief thing, however, is not the exact nature of the application used, but its manner of employment. Merely smearing the application over the skin with the finger is not sufficient; the affected integument must be properly dressed, exactly as a surgical case would be. Time and time again I have had cases of eczema, impetigo, furunculosis, and what not, which have been treated for indefinite periods with proper medication, but in a careless and improper way, without any results at all, and which have reacted well and promptly to the same applications properly employed. The mother, no matter how careful and painstaking, is usually entirely unable to take care of an extensive impetiginous eczema of the face and head, for instance. A regular surgical dressing, including a face mask and a proper bandaging of the face, head, and neck, must be employed; possibly the mother can be taught to apply it; if not, it must be done by the physician or nurse. And it must be renewed as often as may be necessary, once a day or even twice a day. I employ a nurse for that special purpose; and she takes care of the dressings in the case either during its entire course, or until the mother has learned to do it properly herself. And we get results from the local treatment, just as we do in the children's wards in our hospitals.

Impetigo Circinata. The ordinary forms of pus infections of the integument are fairly well known. The highest varieties are impetigoes, showing themselves as very superficial flat pustules soon drying up into impetiginous crusts and leaving only evanescent stains behind. Deeper infections give us ecthyma, with its larger inflammatory focus, distinct suppurative centre, crusting over sharp-cut ulceration, and final healing with a small scar. Pus infection of the hair follicles occasions a folliculitis, marked by deep-seated papules and pustules surrounding hairs, with consequent destruction of the pilous structures. Infections of the sebaceous glands occasion the pustules of acne. Finally, in furuncle and carbuncle we have more general and deeper-seated pus infections involving the subcuticular structures, and not localized in any special part of the skin.

Impetigo is perhaps the commonest of all these infections, and in ordinary cases is readily recognized and easily treated. But it sometimes assumes an appearance that is deceptive and that may lead to its con-

founding ringworm and other vegetable parasitic affections of the skin. I append illustrations of two typical cases of impetigo of the variety



FIG. 33.—Impetigo circinata; early stage. (Gottheil's case.)



FIG. 34.—Impetigo circinata; late stage. (Gottheil's case.)

known as *I. Circinata* to dermatologists (Figs. 33 and 34). The lesions on the face are in their rather early stage; a single flat pustule which has

appeared in the centre of the lesion, had dried up into a superficial yellow crust, and has been succeeded by a ring of pustules which have all followed the same course. This process may continue for a long time, as in the lesions on the hand shown in the other illustration. There is no scar tissue, only denuded epithelium, over the central area already passed over by the disease; an occasional pustule appears in it; and successive marginal crops of pustules occur for a long period of time. The resemblance to a parasitic affection is great, and I have usually seen these cases diagnosed as ringworm. It is just as amenable to the standard treatment for impetigo, the ammoniated mercury ointment, as the ordinary forms of the disease. When once the diagnosis is made, the trouble is soon gotten rid of.

Dysidrosis. This malady has not as yet received any attention in this review. In one sense it is a minor affection of the skin; yet it is common, usually misdiagnosed, and, in bad cases, may incapacitate the patient for long periods of time. It is usually called eczema, and treated as such; a mistake that is very natural, inasmuch as eczema frequently occurs as a supervening affection, and its symptoms often obscure those of the underlying disease. A considerable proportion of the recalcitrant so-called eczemas of the hands and feet are really cases of dysidrosis; and, as the treatment of the two affections is quite different, it is little wonder that our therapeutic efforts in these cases are so often unavailing.

Dysidrosis is an affection of the sweat glands, and occurs almost always in the locations where these are most numerous and best developed, on the palms and soles and in the clefts of the fingers and toes. For some reason entirely unknown to us, but in some way connected with hyperactivity of these excreting structures, since it is much more prone to occur in subjects affected with hyperidrosis, retention cysts of the sweat glands appear. These show themselves in their earliest stages as extremely minute, apparently deep-seated vesicles filled with a clear fluid; when the vesicle is ruptured with a fine needle an extremely small drop of clear fluid, sweat, can be made to exude. They are perfectly visible where the skin is thin and delicate, as in the clefts of the fingers and toes; but on the palms and soles, owing to the many layers of horny cells covering them, they may show only as minute elevations covered with an intact or broken outer layer of cells. They occasion intense itching, and the inevitable scratching soon causes the appearance of inflammatory areas, papules, pustules, exudation, crusting, and all the multiform picture of a straight eczema. This may be severe, and so extensive as to involve the entire hand or foot, or even to extend up the limbs. A careful examination of the advancing margins of the eruption or of the less affected interdigital spaces, will show the characteristic clear vesicles in places that have not as yet become eczematous. One or both hands or feet, or all the extremities,

may be affected; and if the disease is extensive, the patient may be helpless and bed-ridden. It is extremely obstinate to treatment, and extremely apt to recur. I have known of cases in which it has lasted for years in varying degrees of severity, in spite of the very best treatment that I know of. The practitioner who calls such a case eczema, and tells the patient that he will soon be well, will lose reputation as prognosticator as well as a diagnostician.

If the eczematous symptoms are marked, the affected extremities must be treated *secundem artem* for that at first. All irritation of soap and water and of the air must be avoided. Cleansing must be done with warm olive oil and cotton only, and that as infrequently as possible. A proper ointment dressing must be applied, and bandaged on. It is entirely insufficient in this, as in eczema of the ordinary types, to merely prescribe an ointment which the patient applies occasionally with his fingers. After the acute inflammation and the infections have



FIG. 35. - Dysidrosis. (Gotthell's case.)

subsided, nothing has given me better service than an ammoniated mercury cold cream, with a little glycerin and some antipruritic agent added to it. The pharmacopeial *Unguentum Hydrargyri Ammoniati* is not so good, I believe on account of the vaselin which is used as a base. My favorite formula is about as follows: Ammoniated mercury, 10 parts; carbolic acid, ss; thymol, ss; menthol, 1 part; glycerin, 2 parts; wool fat, benzoinated lard, lime water, of each sufficient to make 100 parts. In the later stages of the malady it is well to add a little of some tar preparation to the above. It is customary also to use arsenic internally in full doses in these cases. I have never been quite able to convince myself that it did much good; in fact we have no internal agent that will permanently affect the sweat excretion. I intend to put the next cases that present themselves on the serum treatment mentioned elsewhere in this review; not with any very definite idea as to what it will effect, but with the conviction that it does in some way alter the sensitiveness of the skin, and may affect

the sweat excretion. An illustration of a typical case of dysidrosis is given (Fig. 35); it clearly shows the vesicles on the palms and fingers before eczematous manifestations have complicated and obscured the picture.

Basic Fuchsin in Chronic Ulcerative Dermatitis.—No class of cases give us more trouble than the chronic ulcerations of the leg commonly designated as leg ulcers. This is of course a misnomer, since an ulcer is a symptom only, an epiphenomenon; ulceration of the leg may occur from many causes, among which may be mentioned syphilis, carcinoma, sarcoma, and dermatitis. But by common consent the name is applied to ulcerations due to the latter cause only; for the ulceration of chronic dermatitis is a very common, and, unfortunately, a very lasting affection.

From time to time new methods of treatment, new external applications, are proposed and vaunted for this as for any other intractable skin affection; they all have their brief day, and then are relegated to the limbo of the text-book, or are entirely forgotten. And the reason for this is not far to seek. The legs are perhaps the most vulnerable part of the body in elderly people, especially in such as are compelled, as most of them are, to use them for long hours in their daily labor. Here the vessels are at the greatest distance from the centre of circulation, the columns of blood longest and heaviest and the external supporting tissues most incompetent. The increased blood-pressure so common in advanced life and the vascular degenerative changes that are almost as frequent, combine to occasion dilatations, telangiectases, and varices which still further tend to slow the return blood and lymph current and increase the pressure on the vessels beyond. It is little wonder, under such circumstances, that lymph stasis and edema are frequent, and that reparative processes are slow or entirely absent. Even the slightest injury, such as a scratch of the finger nails or an insignificant contusion setting up a localized dermatitis that under ordinary circulatory conditions would be so slight and evanescent as not to be noticed, may give rise to an inflammatory process of indefinite extent and duration. It may remain as a localized dermatitis without breaking down for years, and the occasion of its advent be entirely forgotten; the conditions being so permanently unfavorable that repair never takes place. But in the great majority of the cases that come under our notice, breaking down has already occurred. The chronic erythema necessarily causes some itching and burning; and the added noxa of a little rubbing or scratching, or a little irritation from some application, suffice to heighten the inflammatory process to death of tissue *en masse*, and ulceration occurs. When they come to us, as a general thing, they are already ulcerated; and the breaking down is so prominent a part of the picture that it entirely obscures the dermatitis that is the real disease.

The very important part that occupation and consequent prolonged

standing and walking play in the production of this condition is shown by the fact that while dermatitis with subsequent ulceration is by far the commonest affection treated in the public skin clinics and in the hospitals that have skin wards, it is rare in private practice and practically unknown among people in easy circumstances. In a dermatological practice of thirty years I think I can count the cases of ulcerative dermatitis that I have had in the office on the fingers of my hands. Elderly individuals who do not have to work for their living, and I count ordinary housework as among the most laborious and injurious of occupations in this respect, attend to the slight first symptoms of vascular dilatation and blood stasis in the lower limbs; they keep off their feet, or wear bandages or elastic stockings. If they get a slight accidental injury, they attend to it properly. Hence they rarely have even the dermatitis, and practically never the extensive ulcerations that are elsewhere so common.

The factors above mentioned are also those that render the treatment of ulcerative dermatitis in our clinics so very inefficient and unsatisfactory. These people must work for their daily bread; and work almost inevitably entails persistence and accentuation of all the unfavorable conditions that have prolonged and increased the malady from the beginning. And they only come to us in the hospital, as a rule, when the ulceration is extensive, and has been present for years; when there are great masses of new connective tissue under and all around it, still further interfering with the circulation of the part, and when all manner of ambulant treatment has been tried in vain for years. We curette the lesions, excise the indurated margins, tie the veins, skin graft, use various local applications, and put them to bed with the leg elevated; and, in the course of months, we sometimes effect a cure. But it is usually only a temporary one at best; they go out to be subjected again to the same deleterious influences; and the badly damaged vessels of their legs soon give them trouble again. It is not uncommon for us in the City Hospital, of New York, to have patients come in who have been here before for many prolonged periods for the same trouble; all manner of operative work has been already done on them; and they still have their dermatitis and their ulcerations.

This unfortunate state of affairs we cannot but regard with regret. We therefore welcome any suggestions that may help us, in spite of our repeated disappointments in the past. The *scarlet red* applications recommended a few years ago have proved of service in some cases, especially those obstinate ones with sluggish watery granulations or glazed surfaces, which seemed to resist all our ordinary means of stimulation. Recently, *basic fuchsin* has been used as a local application in these cases, and May and Heidingsfeld¹ have made an elaborate report on the subject.

¹ Journal of the American Medical Association, May 31, 1913.

May has previously called attention to the germicidal action of basic fuchsin.¹ He now has studied it to determine its toxicity; he finds it a very diffusible germicide, entirely non-toxic, and with a marked stimulative action on epithelium and granulation tissue. Heidingsfeld investigated the material from the clinical side. Twenty selected cases of persistent chronic ulceration of the leg were treated with the following ointment: Grüber's basic fuchsin, 5 parts; eucalyptus oil, 10 parts; anhydrous wool fat, 100 parts. The ulcerations



FIG. 36.—Chronic dermatitis with ulceration. (Gottheil's case.)

cleaned rapidly, and pus and all evidences of secondary inflammation disappeared promptly with relief of the pain. Ten of these cases were exhibited at the hospital clinical society showing very marked and rapid improvement.² In a few cases there occurred an inflammatory reaction, necessitating a reduction in the strength of the ointment. These patients, however, as is usually the case, could not be followed up to the termination of their cases; Heidingsfeld's term of service

¹ Journal of the American Medical Association, April 20, 1912.

² Cincinnati Lancet-Clinic, 1912, p. 606.

ended, some of them left voluntarily when half healed, others had to be discharged for various reasons, etc. In general, however, the results compared very favorably with other methods of treatment formerly employed.

In another series of cases treated in the same way in the hospital, Heidingsfeld's results were not so good; there was much inflammatory reaction and marked pain, and the ulcers did not granulate so satisfactorily. Investigation revealed the fact that the hospital had substituted commercial fuchsin for the Grübler material; a return to the original drug was followed by the same results as had been previously noted. In his conclusions the author reiterates his belief in the efficacy of basic fuchsin in these cases, and bespeaks a wide field of usefulness for it. He refers to the importance of antisyphilitic treatment in some of these cases; I would agree with his recommenda-

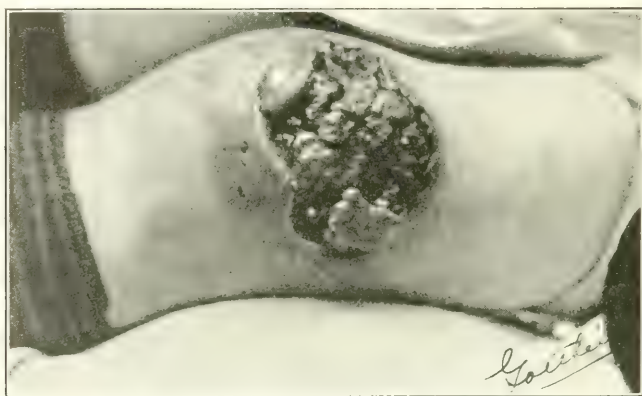


FIG. 37. —Gummatous ulceration. (Gortheil's case.)

tion, with the additional remark that in the majority of cases a definite diagnosis of syphilis can be made when that is the cause of the ulceration, and that then an entirely different plan of treatment is indicated. To emphasize this I append pictures of two typical cases, one of ulcerative dermatitis, and the other of gummatous breaking down (Figs. 36 and 37). Sometimes, however, the distinction is very difficult; and the blood test does not help us much, for the mere fact that a patient has once had syphilis (which is all that the complement fixation test means) does not show necessarily that his present lesion is specific. I am convinced, however, irrespective of the Wassermann test, and regardless to some extent of the physical appearances of the lesion, there is a specific basis to quite a large proportion of these lesions. We put many of them at the City Hospital here under antisyphilitic treatment as well as under local medication; and it is surprising in how large a proportion of cases the antiluetic treatment does them good.

Skin Diseases Among the American Indians. Lain¹ has investigated the occurrence of dermatoses among the pure-blooded American Indians; he examined some 5000 individuals, often under very disadvantageous conditions, for they were all of the so-called uncivilized tribes of Western Oklahoma, mostly Arapahoes, Cheyennes, Caddos, and Kiowas. In general he found them not subject to the same number and variety of skin lesions as are to be found in our own race. Among the school children he found nevus, acne, eczema, lupus vulgaris and lupus erythematosus, pityriasis capitis, and seborrhea most common; in the adults, the prevailing dermatoses were syphilis, verruca, pediculosis, impetigo and other forms of pus infection, and, most frequent of all, tuberculosis of the cervical lymph nodes.

The author is decidedly of opinion that syphilis is not prevalent among the Indians to anything like the extent that is commonly supposed; in fact it was unknown among them until they came into close contact with the Mexican and white races. He believes that their custom of scanty dress from infancy to adult life, or until they are taken into the schools and put under rigid discipline, has been conducive to less prostitution and the resultant diseases than among our white race. The prevalence of impetigo and similar affections is not to be wondered at when it is seen how dirt, and the products of secretion and excretion are allowed to remain on the skins of their babies and children until removed by chance. Then their medicine men and others treat open lesions, ulcers, or infections by sucking them with their mouths, to remove the poison of the witches or evil spirits; and they go from one to another with their filthy mouths and hands disseminating infection. This filthy mouth may soon join a circle of bucks smoking the common pipe of peace, which is passed round from mouth to mouth. The pediculus is almost universally present; yet the excoriations and pustules so commonly resulting from it are comparatively rare.

Certain skin affections, some of them not rare in whites, were not found at all in the 5000 individuals examined. Not a single case of epithelioma, pellagra, psoriasis, lichen, zoster, favus, sarcoma, alopecia, ichthyosis, erythema multiformis, erysipelas, or sycosis was noted. Their skins seemed also to be almost immune to the influence of the poison ivy and other plants that affect the white skin so frequently. Urticaria is rare, and erythema multiforme was not found; which may possibly be ascribed to the simplicity of their menu, which is composed chiefly of a few of the vegetable roots, beans, corn, and the flesh of wild animal or beeves, dried or raw; their occasional feasts on the partially decomposed flesh of an animal dead of disease does not predispose to gluttony. The Indian's nervous system is well balanced and never overtaxed; hence pruritus, hyperesthesias, and other neuro-cutaneous diseases are almost unknown to him.

¹ Journal of the American Medical Association, July 19, 1913.

The most interesting part of Lain's observation, however, were of the hair; not a single bald-headed Indian of either sex was found in the entire 5000 examined. Even syphilis does not seem to affect the hair growth in the same way as it does in white individuals. The color of the hair was almost universally a coarse black or very dark brown. Two cases of red hair were found among the Delawares, but they were not full-blooded Indians. Lain thinks that their almost constantly bared heads accounts for the paucity of scalp disease among them; only four cases of ringworm of the scalp were found, though there were many cases of dandruff among those who had been in schools and had been made to carry out a rigid regimen of comb and brush. In one school nearly 60 per cent. of the children above twelve years of age were affected with it. No case of the kind was found among the older and less confined of the tribes; which seems to confirm the idea of its microbic origin.

With the tuberculosis of the lymph nodes, which Lain found very common among the Indians, we are not here concerned. Pellagra, which is becoming very prevalent in certain portions of the country, was not found, nor had any of the physicians in charge of the Indians seen it among them. Yet the Indians subsist mostly on the poorest quality of corn, eat much spoiled food, and always endeavor to pitch their portable dwellings on the banks of the nearest stream of water. A remarkable finding was the entire absence of epithelioma or other superficial malignant growth; nor did inquiry among the medical men whose whole lifework was among the aborigines enable Lain to unearth a single case. Even internal carcinoma seems to be extremely rare; Levin found that only 29 cases of cancer had ever been reported among all the Indians in the United States. This is a remarkable showing compared with the prevalence of cancer in other portions of the community. The mortality statistics of the United States for the year 1900 give 63.9 deaths from cancer per hundred thousand, and in 1909, 79.6. The same report from the same states gives us a total of 425 deaths from skin cancer alone from 1900 to 1909.

Lain's conclusions are as follows:

1. The full-blooded Indian is not subject to the variety of dermatological lesions found in the white race
2. Full-blooded Indians are almost free from such skin diseases as may be produced or excited by menstrual disorders or an overtaxed nervous system.
3. Though their food is limited in variety and poor in quality they do not have many of the skin lesions that we ordinarily attribute to such causes.
4. Previous to civilization, baldness was probably unknown among the American Indians.
5. While syphilis is common among the different tribes, it is not so prevalent as the sensationalist would have us believe.

6. Tuberculosis of the lymph nodes, particularly of the cervical region, is very prevalent, and might be largely prevented if more prophylactic measures were enforced by our United States Indian Service.

7. The uncivilized Indian is yet free from pellagra, and almost immune to cancer.

Might we not find in a study of his simple outdoor life, limited foods, the character of his skin, etc., a clue that may lend material aid in the discovery of the etiology and propagation of these diseases among our own race of people?

The Internal Secretions and Diseases of the Skin. The past year or two has seen a new departure in dermatological investigation that seems to promise as important results in its way as serology and chemotherapy have effected in syphilis. For the specialty seems to have about reached its limits along the lines that it has followed for forty years or more, the lines of minute observation, diagnostic differentiation, microscopic study, and the empirical use of remedies of all sorts. It has increased our knowledge of the minutiae of dermal disease; it has given us an insight into the etiology of a number of affections; and it has improved our therapeutics in certain directions. On the other hand, it has led dermatological thought into a wilderness of names, of minute differentiations that are not differences, and of research that is of no importance to the practising physician. This last, after all, is the one reason for the existence of the specialty; and a failure to advance in that direction means a failure to advance at all. It has for some time been evident that further progress of importance along the old lines is not likely to take place; and the investigations and discussions in our dermatological societies and journals show the real state of affairs. Minute investigations of diseases already thoroughly described, or so rare as to be mere museum curiosities; endless discussions of terminology coupled with the invention of more names; and an avoidance of therapeutic discussion on any broader lines; this has been of late the tendency and the reproach. At the same time the etiology of many of the very commonest dermatoses is as unknown as it was at the beginning of the period; eczema and psoriasis are as much mysteries as they ever were. And, with the exception of a few measures of permanent value, such as the use of solid carbon dioxide, and some improvement in our curative technique, our therapeutics has remained very much *in statu quo*.

In this etiological and therapeutic impasse we have turned in an entirely new direction in our efforts at improvement, and are directing our attention to that as yet little cultivated but most promising field in general medicine, the internal secretions. These are assuming an ever greater importance in many departments of medicine; and many thinkers believe that in their actions and effects we will find the solution of many problems that are still unsolved. That these secretions exercise a very great influence on the skin and its adnexa is undoubted; and the

review of our knowledge of the subject recently published by Cedercreutz¹ is of great value.

As long ago as 1885, Addison proved that disturbance of the functional activity of the adrenals caused a hyperpigmentation, a bronzing of the skin and mucosæ with a diffuse falling of the hair, which Adami and Meirowsky later explained as follows: The adrenals govern the pigmentation of the skin, changing the albuminous products of the epidermis, tyrosin and its derivatives, into adrenalin in the circulation. Through the action of the oxydases these substances are changed into melanotic pigment in exposed portions of the skin. The pigmentation in Addison's disease is due to deficient change into adrenalin from inefficiency of the suprarenal glands. Since Takamine, in 1901, produced adrenalin in crystalline form, Lewandowsky, Elliott, and others have shown that its administration occasioned distinctly increased irritability of the *arrectores pilorum* of the skin.

THE CONNECTION BETWEEN THE THYROID GLAND AND THE INTEGUMENT has been long evident in myxedema. This affection is occasioned by a lessened or entirely absent thyroid secretion; the skin is invariably white, swollen, cold, and dry; the nails are often brittle, the teeth develop faultily, and the sweat secretion is suppressed. The hair is often prematurely gray, or it may fall out, as Leopold-Levi and H. de Rothschild have noted. All these dermal phenomena disappear under thyroid therapy. Thyroidectomized animals show dermal and dermal appendage changes similar to the above.

In hypersecretion of the thyroid (Basedow's disease), the skin is, as a rule, thinned, smooth, and moist. Chronic edema occurs, and Ehrström has called attention to the frequent occurrence of suggillations, either spontaneously or from very slight traumata. The nails are often dry and brittle; the hair is dry, tends to break off, get gray, and fall out. In women who are much more subject to Basedow's disease than men, there is a diffuse loss of hair, especially on the vertex and at the temples, but never complete calvities. This baldness is so characteristic that it may arouse a suspicion of the presence of the disease in the absence of other evident symptoms. Thus lessened or abrogated thyroid secretion makes the skin thickened, dry, and rough, while increased secretion makes it thin, smooth, and moist. In the adnexa both glandular changes have similar effects; the nails become brittle, the hair becomes dry, breaks off, and falls out.

Scleroderma has been supposed to be occasioned by thyroid hypersecretion, and there are many facts that favor that opinion. By Eulenberg, Osler, and many others the coincident occurrence of scleroderma and Basedow's disease has been noted; and Dittisheim goes so far as to say that scleroderma has been present in 47 per cent. of all the cases

¹ *Praktische Ergebnisse auf dem Gebiete der Haut- und Geschlechtskrankheiten*, Jesionek, Wiesbaden, 1914, p. 1.

of Basedow's disease that he had observed. Other observers agree with Raymond, that any change in the thyroid gland, Basedow's simple hypertrophy, or atrophy, may occasion scleroderma. As regards thyroid therapy in scleroderma, while some observers have seen excellent and even brilliant results, most of their reports have been disappointing. Again, scleroderma, like Basedow's disease, is much commoner in women than in men; Bouttier places the percentage of female cases at 71 per cent., Levin and Heller at 67 per cent. It is also quite possible that changes in other endocrinous glands than the thyroid may occasion scleroderma. It is interesting to note that it is relatively common at the menopause; Luithlen has called attention to the fact that in many cases its advent coincides with a temporary or permanent amenorrhea. Schwerdt and Kölle have reported some cases of scleroderma cured by coeliacin (extract of mesenterial glands); and Cederkreutz suspects the possibility of some antagonistic action between them and the thyroid gland.

THE ROLE OF THE MEDIASTINAL AND MESENTERIAL GLANDS in the internal secretions has as yet been little studied; it is thought, however, that tuberculosis of these structures is the cause of certain skin abnormalities, such as the long eyelashes of tubercular children.

Disease of extirpation of the PARATHYROID GLANDS causes changes in certain of the ectodermal structures, falling of the hair, pigment anomalies, trophic changes in the nails, changes in the ciliary epithelium, chronic ulcerations of the skin, and replacement of the normal dentine of the teeth by ordinary lime salts.

The opinion is gaining ground that alopecia areata, concerning whose etiology we have been, up to the present, entirely in the dark, may be due to abnormalities in several of the glands furnishing the internal secretions. Jacquet and Rousseas-Decelle have noted its coincidence with acromegaly in a case in which no thyroid gland could be palpated. Meachen and Brovis record a case that was cured when gravidity set in, and which relapsed when the menses reappeared. Saboureau has shown that the affection is relatively frequent in women at the climacterium, and Cederkreutz instances one that occurred coincidently with Basedow's disease. The cause of this variety of alopecia is probably not a single abnormality; but there seems reason to believe that the internal secretions are etiologically effective in a certain number of cases at least.

The experimentally gotten THALLIUM ALOPECIA is possibly to be explained by the action of the drug on some of the endocrinous glands. Cataract formation has accompanied some of these thallium alopecias; and cataract itself is regarded by certain ophthalmologists (Schiotz) as due to internal secretory changes.

The dystrophies of congenital syphilis, especially that of the teeth, and indeed the whole Hutchinsonian triad, cannot be explained on

the basis of any direct spirochetic action; it is remarkable that three such distant and differing organs as the epidermis, the teeth, and the labyrinth, should be so frequently affected simultaneously. For one of the triad at all events, the parenchymatous keratitis, Clausen has proven that such direct action does not occur. The supposition that they are secondary effects due to derangement of the internal gland secretion by the specific poison is justifiable, and may ultimately be proven to be correct.

Rickets and the so-called status thymicolymphaticus are to be considered as due to disturbed function and persistence of the thymus gland; in these conditions anomalies of the skin and its adnexa are frequent. The skin is pale, and there is very apt to be disturbances of hair growth, either in the way of deficiency or of a heterosexual excess.

Under the influence of increased secretion of the pituitary gland, as in acromegaly, the skin is harsh, and, as a rule, thickened and pigmented. The patients often show deficient hair growth on the face, head, and body; in the affected male the beard is usually absent. In some cases, however, the opposite of this, a hypertrichosis, has been observed. Sweating is always increased.

On the other hand, in hypopituitarism (*dystrophia adiposogenitalis*) the sweat is increased in amount. Trophic disturbances of the growth of the hair and nails are observed; in fact, in accord with the general infantile habitus of the patient, the general growth of hair is invariably deficient. Leopold-Levi and Wilberts have obtained good results in this condition from the administration of pulverized hypophysis extract.

It is clear from the above considerations that all the various internal secretory glands exercise a manifest influence on the skin, and that this influence is most frequently exerted on its adnexa, the hair and nails. It is universally admitted that the internal secretion of the genital glands exercises an especially powerful influence on the growth of the hair. Facial, axillary, pubic, and other body hair grow under the irritating influence of the hormones that the internal secretions of the reproductive glands occasion. If any additional proofs of the cause of this dermal activity at puberty were needed, it could be found in the fact that in individuals castrated in childhood, the adolescent growth never appears or is present to a very slight extent only.

Medical literature contains many examples of the direct dependence of dermal conditions on the state of the reproductive glands. Here is one from my own experience: A stout brunette, aged thirty-five years, who had had several children, began to suffer from hypertrichosis when, for some unascertained reason, her menses ceased entirely. In the course of a couple of years, the hair growth on the face became so coarse and abundant that her husband shaved her every day, and her cheeks were as blue as those of the most heavily bearded man. I did electrolysis

on her for two years, removing thousands of hairs; at the end of that time she got tired of treatment and withdrew; there were still plenty of hairs left, which she clipped with a pair of scissors. Two years later I met her again, and her face was entirely smooth. Shortly after she stopped treatment her menses had reappeared; and after the second menstruation all the remaining hair on her face fell out, and had not regrown since. Her periods had been regular since then.

Saboureaud has attempted to trace a connection between the reproductive glands and the peculiar total baldness that seems to be a prerogative of the male sex; he regards secretion of the organs in question. Of course, there are probably other causes; some cases may be microbic, and, in others, faulty hygiene, alcoholic excess, and other agents may be of importance. But the facts that this peculiar form of baldness begins soon after puberty is established, and reaches its height during the period of greatest activity of the reproductive glands, is peculiar. Even Aristotle noted this, and wrote: "Neither the child, nor the woman, nor the eunuch, become bald; Why?" As a matter of fact eunuchs do not suffer from premature baldness; and the ancients always pictured the Faun as very hairy as to face and body, but perfectly bald.

The general development of the sebaceous glands at puberty, and the very common occurrence of acne coincident with it must be more than accidental. The bacillary theory of the disease has not received any sure confirmation; and there is certainly food for thought in the idea that the rapid growth of the glands and their frequent infection is connected in some way with the internal secretions elaborated by the aroused reproductive glands.

The entire series of menstrual exanthemata are undoubtedly due to the internal secretions of the ovary. We must assume the same of chloasma. Halban has noted a temporary hypertrichosis gravidarum, and Rebaudi and Waelsh have recorded instances of increased functional activity of the axillary sweat glands during pregnancy, reaching its apogee at the beginning of the puerperium, and then gradually retrogressing. The affection that Matzenauer and Polland described, in 1912, as dermatitis symmetrica dysmenorrhoeica, and which has excited much discussion in dermatological circles, is thought by many to be due to disturbance of the ovarian function with the resultant retention in the blood of the products of that organ, their deleterious effects on the intima of the vessels, and a consequent skin reaction.

It is well known that in cows after each calving a ring is formed at the root of each horn; and several observers have found a transverse furrow of the nails in women after each parturition.

It may turn out that a number of skin affections whose etiology is still a matter of doubt may be caused by changes in the internal secretions. As such may be mentioned erythromelalgia, erythromelia,

atrophia cutis idiopathica, circumscribed edema, rosacea, Raynaud's disease, etc. Moleen has cured a case of erythromelalgia of twelve years' standing, with vasomotor disturbances affecting the hands and feet, with suprarenal substance. It is in their possible relationship to the internal secretions that many other dermatoses of unknown origin, such as vitiligo, psoriasis, ichthyosis, lichen planus, pruritus senilis, and xeroderma pigmentosum should now be studied. A relationship between psoriasis and the ovarian secretion in certain cases seems to be established by cases like Petrinis, in which a woman with inveterate psoriasis had her psoriasis disappear completely in every one of her five gravidities; after confinement, it always reappeared. Bramwell, Grosz, and others, consider certain cases of psoriasis as definite forms of hypothyroidism; in such cases, iodothylin works admirably. Nagelschmidt treated 13 cases of psoriasis with pancreatin, with positive results in 8 cases, and he thinks that some connection between the disease and the internal secretion of the pancreas cannot be excluded.

Ichthyosis has, in some cases, been definitely brought into relationship to the thyroid gland; Weill and Mouriquand, Callcott Fox, and others, reporting cases in which the thyroid was changed or deficiently developed and in which thyroid extract caused a notable improvement in the affection.

The entire subject of the actions of the endocrinous glands is as yet in its infancy, both as an etiological factor in disease of the skin, and as a means of maintaining the functions of that organ in their normal condition. They apparently act in opposite ways in certain cases; in others, several of the glands may be concerned in the disease process, so that Claude and Gougerot speak of an "Insuffisance pluriglandulaire." And there are other organs, such as the skin itself, concerning which we are still in ignorance as to whether they have any internal secretion at all.

From a therapeutic point of view, and that, of course, is of primary interest to us, but little use has as yet been made of the observations noted above. In cases in which a dermatosis is manifestly due to deficient secretion of an endocrinous gland, we can, as in myxedema, remedy it by supplying the deficiency. When the affection is due to hypersecretion of the endocrinous gland, it is difficult to apply a proper remedy. Perhaps a rational organotherapy of the future may find a way by supplying the material elaborated by an opposing gland or set of glands, so as to maintain a physiological equilibrium.

From a theoretical, as well as from a practical, point of view, however, the new departure in dermatology promises well. The days of the Vienna School, which looked upon every dermatosis as an isolated phenomenon of the skin, to be considered by itself and treated locally, are passing away. That school has done much for us, but its period of creative growth seems to have passed. The dermatology of the

future will look to the internal organs, to general metabolic processes, and to the internal secretions for further light as to the causation of disease; and to organotherapy and chemotherapy for further advance in their treatment.

What Shall We Do with Our Lepers? This was one of the chief subjects of debate in the Section on Dermatology at the recent meeting of the American Medical Association at Atlantic City; and a full discussion showed that, though there might be some difference of opinion on minor points, there was unanimity as to the main steps to be taken. In former reviews, I have insisted on some of these points; but misapprehension as to the disease is so common, even within the profession, that it will do no harm to repeat them.

That leprosy is somewhat on the increase in the United States is undoubted, though not to the extent that some of the army officials seemed to believe. With the doubling of our population in the last few decenniums, naturally comes a doubling of the number of lepers and such chronic and recalcitrant cases naturally drift finally to the specialists, so that we see more cases than we used to. The increased immigration from Eastern and Southern Europe, and from parts of Asia where leprosy has always been endemic, has given us some cases; and so also has our more recent connection with the Philippines and the West Indian Islands. But there is no evidence to show that there has been any indigenous increase in the disease; on the contrary, the number of cases in our few foci has been diminishing.

There was practical unanimity of opinion that lepra is not a contagious disease in the same sense that syphilis, tuberculosis, and the exanthemata are contagious diseases. There may be some danger of infection, but it is extremely small, and only in certain stages, as when there are ulcerative lesions, especially of the nasal and buccal mucosa. But for a period that may, and usually does, extend over many years, the infected person is not only not dangerous to his surroundings, but is in more or less possession of all his capabilities for work, and may be a useful member of the community. I instanced the Skin Wards of the City Hospital in New York, where, for thirty years past, we have always had one or more lepers; some of them have been very useful in the institution for years, and no case of transmission of the disease has ever occurred. Beyond using separate utensils, no precaution was taken, and the lepers mingle freely with the other patients. Persons of means who contract the disease can certainly be taken care of in their homes, and may live their ordinary lives for many years, and possibly die of some other affection.

On the other hand, the experience of countries where leprosy is endemic is to the effect that, for the cases that are a public charge at all events, a sensible segregation is the most effective means of eventually stamping out the disease. A sensible segregation, however,

does not mean putting the patient in a box car or a secluded hut, handing him his food at the end of a long stick, and in other ways treating him in a manner that is a disgrace to our civilization. There is absolutely no danger in ordinary contact with a leper; I do not believe that there would be any danger in having one in your house, provided there were no ulcerative lesions present. Unfortunately, the community at large, and many of the profession, I am afraid, derive their impressions of the disease from dim recollections of what they have heard about it in church in their youth. A single syphilitic running about with mucous patches in his mouth, or a single tuberculosis case expectorating over the place, is more dangerous to the community than the few hundred lepers that are here.

What the lepers require is not hospitals or pest-houses, but sanatoria for such as are public charges, and a little sensible supervision for those that are in their own homes. The sanatoria must be organized with a full appreciation of the fact that many of the people in them are practically well, and may remain so for long periods of time. Provision must be made for their occupation and amusement, as well as for their treatment. They need not, save in advanced cases, be kept from ordinary business or social contact with their neighbors; there is no possible danger from having lepers go to stores or theaters. Only for purposes of treatment, and to provide for the possible infective manifestations, and to protect these unfortunates from the senseless prejudices of the community, should they be gathered in leprosaria.

To educate the citizens and legislatures of the individual States up to this view is an almost hopeless task; and the section therefore took measures to get the Association to petition Congress to establish leprosaria in suitable places on a uniform plan. To the State health authorities themselves is to be left the task of regulating the care of lepers that they will undertake themselves, with the privilege of committing these patients, when they are public charges, to the nation's care. The scheme deserves the active coöperation of all physicians; to the end that a rational, decent, and humane provision may be made for the cases occurring in the United States, as has already been done at Molokai for the Sandwich Islanders, and by several European nations.

Changing Views of Pellagra.—Under this title, Dyer¹ calls attention to the fact that the maize theory of the disease was at first almost universally held, and attention was directed almost exclusively to finding out the element in the corn products that should be held responsible for it. Many persons in the South have stopped eating corn on this account. The theory is still held by many, especially by those who have studied the disease in the asylums for the insane. The use of immature

¹ *Journal of Cutaneous Diseases*, February, 1914.

or diseased grain has been regarded as the cause of the disease in Europe for two hundred years.

Our experience in the United States has been that the mere removal of pellagrous patients to higher altitudes and cooler climates will ameliorate their condition and often cure them. Experiences in North Carolina show the influence of environment in its etiology, especially in those much confined to the house, the women and children. The disease seems to travel along certain topographical lines. Also, it has been found to develop much more frequently in summer than in winter.

Samson, as is well known, has long been an advocate of the Simulium as the transmitter of pellagra; but the organism is unknown in many parts of America where pellagra is present and increasing. The sand fly may be one of the agents of transmission, but there must then be others. A profound systemic toxin is evidently at work.

Harris has done much work in the direction of proving that the disease is caused by a microorganism. He has inoculated 2 monkeys with a filtered virus derived from human subjects successfully, and transmitted the virus to a third monkey. All three developed all the intestinal, dermatological, and nerve evidences of pellagra, without any special attention being paid to the diet.

The organism has not yet been found; and, of course, we must be careful in drawing conclusions from monkeys, who are very susceptible to dermatological affections that may be misleading, as happened to the Illinois Commission, when they believed that some of their monkeys were developing pellagra.

The treatment of pellagra, in Dyer's opinion, is still chaotic; salvarsan and arsenic are used, with many other drugs, and the mortality is still large. The disease area is growing larger, however, and the disease is becoming milder and the number of cures greater. A specific treatment will hardly be found until the etiology of the disease is settled.

Radium and Cancer of the Skin. The wave of radium hysteria that swept over the profession last winter was of special interest to the dermatologists for various reasons. As members of the general profession they necessarily regret and deprecate the manner in which the remedy was exploited in the daily press, the improper statements that were made, the false hopes that were raised, the useless expense that was incurred, and the flamboyant advertising indulged in. As specialists, however, they are even more vitally interested; since a large number of cancers are situated on the skin and visible mucosæ, and their treatment falls directly in their province. And necessarily, also, it is these special dermatological forms of carcinoma that are most decisive in estimating the value of a proposed remedy for the disease. They are the ones that are accessible to observation; the ones in which a diagnosis can be made by biopsy with a certainty impossible in most cases in

cancer of the internal organs; and, above all, the ones in which there can be the least doubt as to the final results of cure or non-cure.

We are well aware, of course, of the mischief that is wrought in the lay mind, and unfortunately in the professional one also, by the indiscriminate use of the word cancer. We know, of course, that the term includes two chief varieties of disease, in accordance with whether the carcinoma originates in epithelium of the secreting glandular or the squamous covering epithelium. Though the pathological process, and even the microscopic picture, is a similar one in both classes, and though in our entire ignorance of the real etiology of carcinoma we cannot deny that the cause of both kinds of cancer may be the same, the facts remain that in course, prognosis, and amenability to treatment the two kinds of carcinoma, in a large proportion of cases, differ so very greatly from one another that they are really different diseases. Compare, for instance, to take the two extremes, the history of an ordinary case of cancer of the integument, a superficial epithelioma or a rodent ulcer, with a cancer of the stomach, the rectum, or the breast. In the first case we have, at all events in its often extremely prolonged first stages, a comparatively innocuous or almost benign new growth, that may remain quiescent or growing very slowly for years, that may interfere little if at all with the general health, that has little or no tendency to glandular metastasis, and, above all, that can be readily and radically cured by a variety of well-known procedures; in the second, we have a tumor or ulceration that is often rapid in its progress, that usually interferes markedly and soon with the general body health, that is very prone to glandular metastasis, and that can only be cured, if it can be cured at all, by the most radical surgical procedure. Of course, we know very well that even the most superficial skin cancer may become infiltrating and malignant, and that, in rare cases, it may assume this form from the beginning; and that we are justified in assuming that occasional cancers of the internal secreting epithelium may run a relatively benign and quiescent course. But the general run of cases in the two varieties is as above indicated.

Now the point that we would make is that, in estimating the value of a new cancer remedy, it is scientifically dishonest to group these two classes of different cases together, and to point to cures of the superficial varieties as evidences of the general worth of the procedure in carcinoma. With the effects of radium on internal carcinoma we have nothing to do here; it lies outside our field. We may be permitted to say, however, that the impression conveyed by the accessible reports, both those of a scientific nature and those unfortunately detailed in the public press, is that of failure; and our own experience in a few cases of advanced carcinoma of the skin, tongue, etc., bears this out. The case of radium is exactly like that of the *x*-ray a few years ago; it was first vaunted as a cure for internal cancer, and is now advocated as an

after-operation treatment to prevent possible recrudescence or relapse; and it looks as if it would soon fall into a similar subsidiary place as a cure for the disease.

But with radium as a cure for rodent ulcer, for epithelioma of the superficial, or even of the fungating variety, we have much to do, for cancers of this kind are cured every day of the week by dermatologists by many methods; and cured radically and permanently. We do not need radium at hundreds of dollars a milligram, or peddled out by its possessors or supposed possessors by the hour, for this purpose; such homely, inexpensive, and readily accessible drugs as arsenic, nitric acid, chromic acid, caustic potash, etc., and the ordinary knife and curette, will do the business as well or better. In this very publication four years ago I¹ epitomized the results obtained by Sherwell in quite advanced and dangerously situated cases of this kind with the curette and the acid nitrate of mercury; and I reproduced a series of before and after pictures that show better than words what can be done both as a radical cure and cosmetically in this way. I have myself published² similar cases and pictures, some of them taken years after the destruction of the carcinomas, showing what can be done with arsenous acid. These things are commonplaces of dermatological practice today, and hardly deserve special mention. Reference to them, however, is sanctioned when we see, as I have done repeatedly, pictures and moulages of cured cases of the kind triumphantly exhibited as evidence of the wonderful curative action of the radium salts. So far as dermatology and cancer of the skin is concerned, if radium does cure cutaneous carcinoma, which is doubtful, we do not need it. We have in almost all cases other simpler, undoubtedly efficacious, and proven remedies at our disposal.

Rhinophyma and Decortication. Rhinophyma is the name given by Hebra to that permanent hypertrophy of the skin of the nose with redness, overgrowth of the sebaceous glands and patulousness of their orifices, which is much commoner in Europe than it is here, and which is generally attributed to the excessive use of wines and malt liquors in certain parts of that continent. The pathological anatomy of the diseased skin has been extensively studied; there is hyperplasia of the connective tissue of the corium, increase of the cutaneous vessels of all varieties, with thickening and dilatation of their walls, and both hypertrophy and hyperplasia of the sebaceous glands and enormous dilatation of their ducts. By some,³ it is looked upon as a fibromatous tumor; but my own studies have led me to the conclusion that the affection is a true benign adenoma. We have long since given up the attempt to influence the condition by non-surgical means; and even surgical

¹ PROGRESSIVE MEDICINE, 1911, p. 107.

² The Treatment of Skin Cancers, International Journal of Surgery Company.

³ Keen, Rhinophyma, Annals of Surgery, vol. xxxix, p. 665.

measures, for reasons that will appear later, often give us temporary and unsatisfactory results.

Rhinophyma is generally looked upon as the third and last stage of an affection that is extremely common, but that which fortunately rarely reaches its full development with us. The ordinary redness of the nose, at first a temporary and later a permanent condition, leads to dilatation of the bloodvessels and a moderate thickening of the skin. The first stage is very common; the second is less frequent. Various internal and external agents have been blamed for the occurrence of the affection. Chronic alcoholics often suffer from the redness of the



FIG. 38

FIG. 39

nose and the distinct rosacea that mark it; but these are secondary to the chronic gastric catarrh that these individuals suffer from. The same internal affection from other causes will have the same results; and the spinster who has her teapot on the stove all day, and drinks a practically unlimited amount of the beverage, will have a red nose and be unjustly accused of secret tippling. Entirely different influences will have the same effect. Exposure to the weather causes rosacea; men in many occupations, such as hack drivers, have rosacea, yet may not be indulgers in alcoholic liquors at all. Overexposure to the heat of a fire, as occurs in cooks, candy bakers, etc., may occasion it.

Heineck¹ records an interesting case of the kind that was cured, for the time being at least, by operation (Figs. 38 and 39). He calls attention to the undoubted fact that most of these patients, never having gotten any good effects from non-operative treatment, regard their affection as incurable. Heineck's patient had been told so by a number of medical men. He was a tailor, and was not exposed to the weather or to the effects of artificial heat; he had no gastric symptoms; but he was a Bohemian, and admitted to the habit of drinking "several" glasses of beer daily. The reporter of the case evidently thinks this a matter of small moment etiologically; but "several" is an elastic number. I had once a patient who admitted that he took beer "moderately;" but I found on inquiry that he meant by that his weekday allowance of beer (he was an undersized German zither player) was 60 glasses on week days, and 90 glasses, a quarter keg, on Sundays.

The operation done by Heineck was an ordinary decortication; and the result reported was a perfect one, as the pictures accompanying the article show. It would be interesting, however, to see a photograph of this patient six months, or a year or two, from now. The trouble with the decortication operation is that it is, in the great majority of cases, unsuccessful. Sometimes very soon, but almost always sooner or later, the skin of the nose begins to hypertrophy again, and the growth is finally as large or larger than it was before. The trouble is that after the removal of the central lobe, or of the two lateral lobes of redundant tissue, or of all of them, there is no healthy tissue available to cover the defect. The same disease that has attacked the tip of the nose is present in the ala and in the skin of the adjacent cheeks and forehead. In these latter situations, also, the skin is reddened, thickened, the sebaceous glands are enormously hypertrophied and increased, and the ducts stand out as large openings, sometimes half the size of a slate pencil in diameter and plugged with hardened secretion. The removal of all the diseased tissue would leave a hiatus in the centre of the face that it would be almost impossible to fill in; and, if this could be done, the resultant deformity would be much worse than that of the original disease. The flaps are therefore made of diseased tissue filled with infected glands and gland ducts; the wound usually heals slowly by granulation; the irritation from the surgical interference seems to stimulate the already diseased sebaceous glands in the neighboring skin to increased growth.

My own experience with the decortication operation for the relief of rhinophyma may be exemplified by the following case. The patient was a candymaker, and spent many hours a day bending over the hot and steaming contents of his kettles. In addition to that, he was an Alsatian, and drank an abundance of light wine. His nose had slowly

¹ Journal of the American Medical Association, January 10, 1914.

increased in size until it formed an enormous mass, the central lobe overhanging the opening of his mouth, and the side lobes spreading out like wings. I removed the entire skin of the central lobe down to the cartilage; it was hopeless to attempt to do anything with the lateral lobes, as the skin of his cheeks was affected half-way to the ears. The mass removed filled a four-ounce specimen jar. I got an infected wound, of course: the incisions were through the infected sebaceous gland ducts and acini. Healing was very slow, but was finally accomplished, with good cosmetic results for the time being. The patient then passed from under my observation; but I heard of him from other members of his family during succeeding years. A few months after I lost sight of him, his nose began to grow again, and was soon larger than ever. Then a very well-known surgeon, now dead, operated on him, with the same result; temporary improvement, followed by renewed growth. After that he was operated on twice more; and each time the growth returned. This is hardly an encouraging record. If rhinophymas could be radically cured by a simple decortication, there would soon be no cases of the disease.

The New Serum Treatment in Dermatology. It has been for a long time evident to the dermatological world that scientific progress, especially on the more immediately important therapeutic side of our specialty, has been coming to a standstill, and that further advance along the lines already occupied does not seem likely to give any but unimportant results in the way of small improvements in methods and technique, leaving the main problems in this special discipline, both from the scientific and from the practical side, entirely untouched.

During the last twenty-five years, the influence of what we may call the Vienna school in dermatology has been supreme, which regarded the vast majority of dermatoses as local phenomena practically disconnected from the general system, and to be studied and treated as separate entities. A tremendous impetus was thus given to the study of the local disease phenomena; every malady has been subjected to the most minute microscopic study, and so has also been studied the actions of local remedies on the skin. I would not for a moment be understood as claiming that this great work, which has taken up the lifetime of multitudes of painstaking workers, has been useless. We now know practically all that can be known, with the instruments of investigation at present under our control, of the pathological processes in most of the dermatoses. The ultramicroscope may enable us to peer a little farther into the abnormal processes that go on in the integument; but, until we develop some radical departure in our methods of investigation, there seems to be but little hope of any really important advance along these lines.

From the practical point of view, the results of the unending pathological studies of the past years have not been very satisfactory. It

is true that biopsical findings have been developed into a recognized aid to diagnosis in doubtful cases; but its usefulness has recognized limitations, and many dermatologists assign to it a rather limited field in the scheme of their daily work. When we reflect that it is at the present time impossible to distinguish from one another under the microscope two such common and clinically different diseases as chronic eczema and psoriasis; when equally competent dermatopathologists will differ as to whether a tumor is a syphiloma or a new growth of non-luetic nature; when the pathological interpretation of a form of tumor which has been so abundantly and so thoroughly studied as the so-called sarcoid is still a matter of doubt, we can readily appreciate the limitations to advance in this direction. The chief results of biopsical study, combined with clinical observation, has been to multiply the varieties of disease processes and to further increase an already overburdened terminology.

Therapeutically, and this after all is the end and object of all our study, the results of pathological investigation in dermatology have been very small indeed. I do not recall at this moment a single measure of importance that is based upon, or owes its inception to, pathological study. It helps us in diagnosis up to a certain point, and that is all that can be said of it. Further progression in this direction is not hopeful of important results. In point of fact, the few measures of permanent and positive value which we have gotten in recent years, with the possible exception of salvarsan in the treatment of the syphilodermata, have been the product of purely empirical investigation. The *x*-ray, in an extremely limited field, and solid carbon dioxide, are the only measures that have held their ground. The various vaccines and sera still hang, like Mahomet's coffin, between heaven and earth, successful, possibly, in the hands of a few, but useless and unavailing for most of us. This exhausts the meager list.

It is very evident, therefore, that it is in other directions that we must look for future advances in dermatotherapeutics; and there is a very manifest and growing tendency to turn to the general organism and to systemic conditions in our search for the causation and therefore for the remedies for a multiple of dermatoses of obscure nature. By far the most hopeful of these at the present writing is the experimental therapeutic work that has been done with autogenous and foreign blood serum. Undoubted beneficial action has been gotten by various observers in a large number of affections by the intravenous administration of the patient's own serum and that from other individuals, either inactivated or not; and it is to this new field of therapeutic effort that I would now direct attention.

A definite theoretical basis for the curative effect of the blood serum employed in this way is as yet wanting; and it will probably be a long time before it is obtained. Human blood-serum is an extremely compli-

cated organic fluid, the intimate nature of which we are still but imperfectly acquainted; and it certainly undergoes changes of great importance when removed from the body and deprived of its fibrin and cells. The material that we reinject into the veins is not the same that we take out; that much is positive from its indubitable effects. But just what that change is, we are entirely unable to say. It is possible, and perhaps more than possible, that the material supplied thus artificially to the blood has some relationship to, or action on, the ductless glands and the internal secretions, those as yet rather mysterious vital organs to which we are beginning to look for the solution of many an obscure physiological and therapeutic problem. It may stimulate these glands, or supply some material elaborated by them or required for their action, or add a ferment that in some way influences them or their products. The epoch-making work of Sajous on the whole subject of the internal secretions has formed a basis for future labor in this direction; but the entire subject is as yet too inchoate and too undigested for any consideration in its present application here. It is subject matter for a coming generation of investigators.

Leaving out therefore all considerations that are at this time necessarily conjectural, it seems possible that the mere abstraction of blood in certain conditions must have a profound influence upon the body at large. It is impossible that generations of skilled medical observers, including many of the greatest minds that have ever devoted themselves to the healing art, could have been entirely and absolutely mistaken when they used bleeding for centuries as a therapeutic measure; they must have seen good come from it in certain cases at least. The pendulum of opinion has indeed swung entirely against it in the last hundred years; but there are already symptoms of the return swing, and we are not only beginning to abstract blood again, but, going a step farther, to return it to the circulation in altered form. Groping in the dark, however, as we are in this field, it is to therapeutic attempts and their results that we necessarily turn.

It was in the treatment of certain grave constitutional diseases, in hemophilia, the hemorrhagic diathesis, and other similar conditions that the serum treatment won its first successes; and it was soon tried in various other toxemic conditions. The growing recognition of many of the affections incidental to the pregnant and puerperal conditions as due to toxemia led to its employment for the relief of the vomiting and other disorders so common under these circumstances, as Rongy¹ and others have shown, with most encouraging results. Veiel² has employed it in a pregnancy dermatosis, a severe case of herpes gestationis. Toward the termination of pregnancy in a case of his, a very severe attack of this affection appeared, resisting all manner of treat-

¹ New York State Journal of Medicine, January, 1914.

Münch. med. Woch., 1912, No. 35.

ment, and getting progressively worse. He injected into the patient's veins the serum of a healthy gravida, with temporary improvement after the first administration. After a second one of twice the amount, however, there was a very marked improvement, a rapid disappearance of the itching, and no return of new bullae. Rubsamen¹ used the serum treatment in two cases; one was a severe pruritus from pregnancy toxemia, and the other a pustular herpes gestationis occurring in child-bed. Both cases were cured by the administration of clear blood, serum from healthy gravid women. Rongy² has obtained similar results in analogous cases.

The method was soon extended to the treatment of dermatoses unconnected with pregnancy and parturition. Spiethoff³ has published several articles recounting his experiences with the treatment in various dermatoses. He had special success in eczema, citing a case of eczema rubrum that was so susceptible to the ordinary drugs that no effective treatment could be employed, and which was rapidly cured after the injections. In psoriasis, it was sometimes successful and sometimes not. Besides this he has used it with good results in dermatitis herpetiformis, chronic urticaria, and prurigo.

Ullmann⁴ used the serum treatment in 18 cases of itchy dermatoses, employing, however, not an autogenous, but a foreign serum derived from healthy individuals with a negative Wassermann; he obtained his best results in pruritus, 4 cases of which he cured by this means. One prurigo case also was cured. In 3 cases of urticaria there was lessened itching, but no cures. In 2 cases of general eczema in children, there were no results from the serum alone, but quick and excellent ones from local treatment of the ordinary kind after the injections were ended. One case of pemphigus was cured; but the author was not successful in 7 cases of dermatitis herpetiformis.

Linser⁵ has perhaps had more experience with the method than any one else, and found that, of 18 cases of urticaria, 15 were cured in from two to three injections. Of 12 cases of prurigo treated in this manner, their ages being from five to ten years in most cases, and 2 of them seventeen and twenty-one years old respectively, all got well, and 6 of them were still well three and six months later. Twenty-four cases of strophulus and urticaria papulosa, most of whom were treated with their mother's serum, showed improvement, but not a single cure. Eight cases of pruritus senilis all gave good results after two or three injections. In eczema, mostly of the head in infants with some cases of general eczema in adults, the itching soon stopped, and the results are noted as partly good. In psoriasis and in extensive lupus, this

¹ Deutsch. med. Woch., 1913, No. 20.

² Loc. cit.

³ Deutsch. med. Woch., 1913, No. 10; Med. Klin., 1913, No. 24.

⁴ Archiv f. Dermatologie, September, 1913, p. 125.

⁵ Ibid., vol. exiii, p. 701.

author saw no special results. Two cases of purpura and one of scurvy were quickly cured. Six cases of pemphigus, including one of pemphigus foliaceus, were improved, but not cured.

Laithlen,¹ commenting on the paper of Holobut and Lenartowicz² recording their results in the treatment of pemphigus with the content of the patient's own bullæ, states that Linser, Mayer, Spiethoff, Ravaut, Pretonius, and others, have shown that the administration of auto- or foreign serum and other colloid complexes has had good effects in exudative dermatoses; and that his own experience is the same. Heuck³ has also had good results, though he did not see any in psoriasis and eczema adulatorum. Perhaps the most remarkable report, however, is that of Pretorius,⁴ who had a pemphigus chronicus in a female patient which had been long watched and unavailingly treated. She was given 20 c.c. of blood from her husband intravenously; she was reported as cured a week later, and eight months afterward there had been no relapse. Other authorities have reported equally remarkable results in this intractable affection.

Bruck⁵ tried physiological salt solution in the place of blood serum, and got unmistakably good results in pruritus universalis, urticaria, erythema multiforme, etc.; and Simon, Rosenthal and Zieler confirm them. All the other investigators, however, have used blood serum.

The importance of these results, coming as they do from competent and reliable observers, is manifest. It is no exaggeration to say that some of the very common dermatoses, inveterate psoriasis, generalized eczema, and chronic urticaria, are not infrequently the despair of the practitioner. In a not inconsiderable proportion of the cases, treatment along accepted lines, no matter how persistently and thoroughly carried out, gives only partial and unsatisfactory results. This is well illustrated in the following case seen recently. A young girl was brought to me with a history as follows: She had had a general eczema of the seborrheal type for four years past. Sometimes the affection would recede, only the head, face, and genitals being affected; and then, without any ascertainable cause, it would spread until the entire body surface was involved, and she would be bed-ridden. At no time during the four years had she been free from the affection. She had been subjected to all manner of treatment, internal, dietetic, and external, and had been under the care of competent specialists for long periods of time; for seven months she had been in the wards of the Skin and Cancer Hospital here. Yet her condition was practically unimproved; the periods of general extension and complete disability alternated with those of retrogression as before, and the disease was about in

¹ Dermatologische Wochenschrift, October, 1913, p. 1229.

² Ibid., 1914, p. 181.

³ Münch. med. Woch., 1913, No. 16.

⁴ Archiv f. Dermatologie und Syphilis, September, 1913, p. 125.

⁵ Ibid., 1913, p. 1225.

the same condition as it was at first. We all know how little we can really do for our cases of chronic urticaria, pruritus senilis, lichen planus, and dermatitis herpetiformis, not to speak of the rarer affections of equally unknown etiology. Any method of treatment that holds out hope, especially any method that is an attempt to cope with these distressing affections along new lines, is worthy of investigation.

For this purpose, the wards of our City Hospital here offered unrivalled opportunities. The experimentation could not well be done on ambulant dispensary material, for various reasons. The therapeutic process is tedious, and requires facilities that are not to be had in most dispensaries. A properly equipped laboratory to prepare the serum, means for its intravenous administration in the right manner, and the assistance of an intelligent staff were needed. Above all things, the patients had to be under control and observation for prolonged periods. All these conditions were practically unattainable in ambulant practice, but could be gotten in the skin wards of the hospital. Even here, however, it took a long time before suitable arrangements could be made. The press of work on the house staff and the laboratory in a busy general hospital is such that it is difficult for them to obtain the time to do this serum work on a larger scale. Nevertheless, it was possible to treat and observe a number of cases before my term of service ended on January 15 last; and in conjunction with Dr. Satenstein, the assistant visiting on the service, I have lately recorded¹ my personal experiences with the method. I had at that time at our disposal the completed records of 12 cases, 6 of very extensive general psoriasis, 3 of generalized eczema, 2 of pemphigus, and 1 of leprosy.

There was very little experience to guide us in the beginning as to dosage, frequency of administration, etc. Pretorius, in his pemphigus case, administered 20 c.c. of serum from the husband of the patient. Spiethoff drew 50 c.c. in young persons, and 100 c.c. in adults, and administered what serum he could recover from these amounts. Linser used 20 c.c. of serum in each case. Our practice was to draw 100 c.c. of blood in the average case, giving us usually 20 to 30 c.c. of serum. The serum was inactivated, being administered two or three hours after drawing, at the most. This has been the practice with most of the experimenters, though Spiethoff inactivated his before administering it. The intervals also between the injections has varied a good deal, some giving them every other day or every third day, and others at five- or eight-day intervals. As it was necessary in the hospital to establish a routine, we gave them invariably at weekly intervals; so that each patient, getting four to six injections, had received at least 100 c.c. of the serum. We were unable to say that either the dosage or the intervals of administration above indicated were the best; pos-

¹ Medical Record, April 4, 1914.

sibly larger single doses or more frequent smaller ones might give better effects. As a matter of fact, in private work done subsequently to the term of our hospital service, we have come to draw much larger amounts of blood, 180 to 210 c.c., and injecting 80 to 105 c.c. of serum, or as much as we could recover. So far as its immediate effect on the patient is concerned, it seems to be a matter of indifference how much is taken; it has no effect on them at all. The only contretemps that we have encountered was in the case of one patient who had a distinct epileptic attack on each of the two occasions on which his blood was drawn. He claimed to be ignorant of the fact that he was subject to epilepsy, though he acknowledged having "fainted" on several occasions in the past; but he was so frightened at the seizures that he withdrew from treatment.

As we desired to observe the effect of the serum injections themselves on the patients, very little, if any, local treatment was employed during their administration. It was therefore merely as a matter of convenience that we kept the psoriasis and eczema cases in the hospital while they were getting the injections; they might just as well have been at home during this time. As will be seen from the history abstracts given below, the time of local treatment was, in many cases, shortened in a most remarkable manner. With the serum administrations given ambulantly, as could well be done, this would mean a reduction of the period of necessary hospital detention of at least 75 per cent.; a factor of prime importance from an economic point of view, as well as from that of the patient himself.

The method employed in these hospital cases was to use the patient's own blood serum in every case where that was possible. The exceptions were the pemphigus cases that were in very bad condition, and were given serum from a case of epidermolysis in the ward when it was available, and the leprosy case, to whom serum from a brother and a sister alternately was administered.

The results of the injections in many of these cases were striking enough to merit recapitulation in abstract:

CASE I.—Julia F., aged twenty-one years, general psoriasis for the last eight years, three to four attacks yearly at first, now the eruption is present continuously. Skin is cleared only by eight weeks' treatment with chrysarobin up to 40 per cent., and arsenic in very full doses. Present attack began six months ago. Improvement in the lesions during the period of serum treatment, without any local measures at all. January 24, 1914, chrysarobin vaselin 3 per cent. to the body, white precipitate ointment to the scalp; January 26, lesions disappearing rapidly; January 27, chrysarobin 5 per cent.; January 31, lesions all gone. Time of local treatment, six days.

CASE II.—John H., aged forty-six years, had psoriasis for the last twenty-five years; has been in this hospital twice during the last five

years for it, staying six to eight weeks each time, and getting chrysarobin up to 40 per cent. and arsenic in full doses. Present attack began two months ago. Large, greatly thickened patches were present, with considerable itching. During the serum treatment, and without local measures, there was lessening of the scaling and itching. January 2, chrysarobin 3 per cent.; January 3, improving rapidly, chrysarobin 5 per cent.; January 5, lesions gone. Time of local treatment, three days.

CASE III.—Archibald M., aged thirty-nine years, had psoriasis five years; was in the hospital for six weeks for it two years ago; present attack has lasted eighteen months; self treatment. The scaling disappeared during the period of serum treatment alone. January 20, chrysarobin 5 per cent.; January 24, marked improvement; lesions smooth and flat with the general skin surface; February 4, eruption all gone, save a few lesions on the legs. Time of treatment, fifteen days; result imperfect, possibly because the serum injections were administered at intervals of two or three days only. A similar observation has been made in Germany.

CASE IV.—Hannah M., aged forty years, psoriasis for fifteen years, one attack at least each year. Was in the hospital here for the same trouble four or five years ago, getting chrysarobin up to 30 per cent. Has present eruption about four months; many greatly thickened plaques. The serum was pushed in this case to over 100 c.c., because, after primary improvement, new psoriatic lesions began to appear while it was being given. January 7, chrysarobin 3 per cent. to the body and white precipitate ointment to the scalp; January 9, great improvement; lesions fading rapidly; on the arms purposely left without local treatment, the same occurred; January 10, lesions gone. Time of treatment, three days.

CASE V.—James M., aged twenty-eight years, has had a number of attacks of generalized psoriasis since his eighteenth year; at present is suffering from an acute outbreak. Marked improvement under the preliminary serum treatment. January 15, chrysarobin 3 per cent.; January 20, lesions gone. Time of treatment, five days.

CASE VI.—Joseph D., aged thirty years, had been in a medical ward for an acute nephritis since July of this year; on recovery was sent to the dermatological ward for his psoriasis, which he had had for years. Two years ago was here six weeks for it. No change, other than decrease in the thickness of the plaques during the serum administration. January 15, chrysarobin 3 per cent.; January 17, slight improvement, chrysarobin 5 per cent.; January 22, psoriatic lesions all gone. Time of local treatment, eight days.

CASE VII.—James R., aged forty years, had eczema rubrum of the legs and arms, six months' standing. Had been in Bellevue Hospital for a long time; no improvement. There was considerable betterment

under the serum treatment alone, especially in the acuity of the inflammation and in the itching; the local treatment being a simple oil dressing. January 20, 10 per cent. ichthyol and zinc ointment; January 30, arms and hands almost well; legs much better. Time of local treatment, ten days, in an eczema of six months' standing, with very great improvement.

CASE VIII.—Ida G., aged eighteen years, extensive general seborrheal eczema following an attack of erythema multiforme. Had had all kinds of treatment at the hands of general practitioners and specialists for months; had been an in-patient in a special hospital for five months, and was in just about the same condition as at first. The eczema would sometimes improve for a time to a small degree, but would soon spread all over the body again. Face, head, and limbs were most markedly affected at the time that treatment was begun; the entire body surface was involved, and the patient was in a very miserable condition. Serum was gotten from her sister, and 120 c.c. had been administered up to the time of reporting. The local treatment was limited to a continuance of the 2 per cent. salicylic acid oil which she had been using for some time without much effect. She improved rapidly under the serum, especially as regards her legs. On December 2, there was a new general eczematous outbreak, papular in character. By January 6, this new attack had been mostly recovered from, and there was a slow but distinct improvement in both the local and the general condition. Our service ended at that time; but it was reported that the patient left the hospital some weeks later very much improved, but not cured.

CASE IX.—Rose S., aged eighteen years, had had more or less eczema on various parts of the skin for five years past, improving at times; but never getting entirely well; she also had had prolonged ambulant and hospital treatment. For nine months past, her condition had been practically unchanged; there was a chronic eczema of the flexor surfaces of the limbs, and eczematous areas on various other locations. Serum treatment was begun in the City Hospital on January 18, locally a boric acid ointment with 2 per cent. of sulphur. A very marked improvement was reported; case still unconcluded.

CASE X.—Sarah G., aged forty years, pemphigus foliaceus. This patient was in a very advanced stage of the affection, and all other measures had absolutely failed to make any improvement in her condition. She was put on the serum treatment as a counsel of despair; the two injections that were given her did not seem to have any influence on her condition; she died two weeks later.

CASE XI. Michael S., aged forty-two years, pemphigus vegetans. This was also an advanced case that was going from bad to worse in spite of all our efforts. He received three serum injections from a case of dermatolysis that we had in the wards. For a time there was a

distinct improvement, especially in the vegetating masses on his face and around the mouth, but a fatal termination was not prevented.

CASE XII. Lena T., aged forty years, maculotubercular leprosy, ulcerations of the phalangeal joints, lepromata of the vocal cords, etc. This patient at the time the report was made had been receiving weekly serum injections from a brother and a sister alternately, with marked and steady improvement. She gained in weight and strength so that her appearance was quite changed, her ulceration steadily improved, her laryngeal symptoms were much less distressing, and her voice very greatly improved. So marked was the change for the better in this patient that there was no difficulty in getting a steady supply of serum from her relatives, who came to the hospital weekly to give it.

Since the above report was written, we have used the serum treatment in private practice only, and our results are to be reported in the near future. They include cases of chronic urticaria, psoriasis, chronic furunculosis, ulcerative radiodermatitis, lichen planus, etc. They are still under treatment at this writing, and it is too soon to report definitively about them. So far as we have gone, we can say that some cases showed marked, and one or two marvellous, improvement, while some others did not seem to be influenced by the treatment at all. The exigencies of private practice are such that experimentation on a larger scale is difficult. The treatment is necessarily somewhat expensive, since it requires the services of an assistant and a nurse, and takes an hour or more for each serum administration. Hence some of the cases withdrew after two or three injections, or when they were improved and made comfortable. In other cases, and notably in one of furunculosis of the neck that had been present for two years without intermission, I refused to continue the injections, though the patient was steadily improving, because he absolutely refused to take the elementary precautions against local reinfections by a proper dressing, insisted in wearing a collar, etc. One case of lichen planus of many years' standing turned out to be an epileptic, and had an attack of petit mal during each of his two injections; this frightened him so that he would have no more. In still another case, one of chronic axillary abscesses of months' standing, the patient's psychic objections to seeing his blood drawn led him to refuse further treatment of this kind. We are far removed from the days of our grandparents, to whom an occasional bloodletting was a matter of indifference.

One case of the private series deserves especial mention; I can only record it with wonder, and state the facts as they occurred. The patient had a deep ulceration measuring at least six inches each way and occupying the entire upper anterior abdominal surface. He had had prolonged x-ray treatment for splenic leukanemia some six years before; this had resulted in the formation of the familiar atrophic skin, surrounded by a broad area covered with telangiectases. It had

always given him more or less pain and trouble; but in the autumn of last year it began to get worse, and show distinct signs of inflammation. When I saw him a little later the entire area of skin was necrotic, and the picture of a chronic gangrenous radiodermatitis was complete. His condition became so bad that he was confined to bed for six weeks, and required the services of a nurse. Local treatment was almost impossible, on account of the exquisite tenderness of the lesion; and we were absolutely compelled at last to have recourse to morphine, which was the only thing that would at all control the intolerable pain. At one time during this period he lost hope completely, and both he and his family expected death. He began to improve a little, however, the sloughs beginning to separate very slowly, and a very small line of epidermization beginning to appear at the margins of ulceration; his pain, however, had diminished but little, and he still needed narcotics, and the sensitiveness of the ulcerous area was still so great that 1 per cent. of balsam of Peru in cold cream was the utmost that he could stand locally. I proposed autoserum injections, and with great difficulty he was brought down to the office for that purpose. About 150 c.c. of blood was drawn, and 70 c.c. of serum was administered; neither operation causing him any trouble at all.

When he reappeared one week later he was a changed man. He walked alone, his face was bright, he volunteered the statements that he was very much better, that for the first time he got several hours' continuous sleep at night, said that his pains were very much less, that he was getting some taste for food again, and asked that the strength of the local application be doubled, since the ulceration was not nearly as sensitive as it had been. Dr. Manisoff, the physician who had been caring for him with me, and who came to the office with him, confirmed these statements, and added that he had only once given him a very small dose of the opiate during the past week and that that was on the evening of the injection. An examination of the lesion showed an equally remarkable local change. A half-inch zone of growing epithelium was apparent all around the ulceration; the black sloughs were loosening rapidly; and the patient permitted the free removal of large masses of necrotic tissue with the forceps and scissors, which caused some bleeding but very little pain.

During the month that has elapsed since then there has been a steady and equally rapid progression. He has had four serum injections of nearly 100 c.c. each, and has gained at least fifteen pounds in weight. He goes to business now every day, and can do a large part of his ordinary days' work. He sleeps six or seven hours at night, and takes no medicine at all. The ulceration is two-thirds healed; the epidermized margin is an inch and a half in width, and new islands of epithelium are appearing all over the still ulcerated area. There is practically no pain in the lesion. My estimate is that two to four weeks of time will suffice the complete cure of the lesion.

In a general way it may be stated that the results of the serum treatment in private practice and in a few hospital cases in which I have been able to have it used since my annual hospital term ended, have been confirmatory of those in the series of cases more carefully recorded above. My conclusions, however, shall be drawn only from these latter, and are as follows:

The psoriasis cases were most numerous, and in all of them it apparently had a marked influence on the reactivity and the susceptibility of the skin. They were kept in the hospital during the time of the injections for convenience of observation and control only; no local treatment was used during that time. They might as well have been at home and received ambulant treatment. The times of local treatment were six, three, fifteen, three, five, and eight days respectively; about six days on the average. This is to be compared with the six weeks or more of local treatment that is usually required. It means about one week of hospital treatment in these obstinate and recurrent cases instead of six; a point of prime importance economically, as well as from the patient's standpoint. In no case did we have to exceed 5 per cent. of chrysarobin strength to clear the skin rapidly, and in most cases less than that sufficed; which must be compared with the 30 and 40 per cent. strengths formerly required. This is a point also of great importance with drugs so disagreeable and costly as to clothing and bedding as are chrysarobin and tar when used on extensive areas of the body. Finally, no case received any internal treatment at all, in place of the arsenical injections pushed up to the point of tolerance which were formerly in vogue. I have for many years employed a 1 per cent. solution of sodium arsenate, administered hypodermically, for the internal treatment, believing that I saw some good effects from it, especially in the less actively inflamed cases; and when the daily injections in increasing doses ran up to forty or more drops, as they usually did, they were not a matter of indifference to the patients. Evidence of one kind as to the value of the serum injections was given without exception in every case; and I regarded it as of great value. Our permanent hospital nurses in charge of the skin wards, who had had many years' experience in the care and treatment of these cases and who practically carry out the treatment ordered by the visiting physician, see the patients daily, and were in most cases much more experienced and better qualified to judge than the changing and inexperienced house staff, were decidedly of the opinion that the injections had a very marked and beneficial influence. Those patients, finally, who had been in the hospital in former attacks, and who were therefore in a position to compare results, were most enthusiastic in their appreciation of the new method.

The eczemas were fewer in number, since naturally only the most extensive and obstinate cases of the kind are kept in the wards. The

results are less decisive than in the psoriasis; yet great improvement was noted in all of them, and I feel hopeful that further experimentation will substantiate the value of the serum treatment in these very distressing cases.

In the two cases of pemphigus, there were practically no results at all, though it is in precisely these cases that very wonderful records come to us from German sources. Both cases, however, were hopeless and practically moribund at the time that the treatment was instituted. Its use was a counsel of despair, and we felt sure that it could do no harm. It may be of value in earlier cases, and especially at the outset of the disease. We are entirely ignorant, it is true, of the etiology and true nature of the disease; and though it looks as if some deep-seated septic process was at work, anything that will decrease the susceptibility and reactivity of the skin in cases in which the integument is the chief organ involved, may give us unexpected service. In any case, in this therapeutically hopeless disease, any innocuous method that gives the least hope deserves a trial.

In the case of leprosy, the benefit from the treatment was unmistakable and quite rapid at first; later it stopped. There is, of course, no reason to hope that in this disease it will do more than ameliorate the symptoms and improve the patient's general condition; but, as in the case of the pemphigus sufferers, even that is worth striving for in a malady that is so entirely beyond the reach of all our ordinary therapeutics.

To bring the clinical evidence up to the date of this writing, I may add that we are getting the same results in the private psoriasis cases that were observed in the hospital ones; that in chronic furunculosis the results have been extremely encouraging, as in one case of six months' standing there was only one superficial infection after the treatment, and the patient was discharged cured; and that in lichen planus, chronic urticaria, and pustular acne, etc., the patients are doing very well indeed, though it is too early as yet to speak of results.

A word as to methods, dosage, etc., will not be amiss. The amount of blood withdrawn in the hospital cases was small, some 75 to 100 c.c. in all. The reason for this was in the first place that those were about the amount employed by the earlier users of the method, being about the quantity that can be withdrawn by the steel venipuncture needle of the ordinary caliber before clotting occurs. With the platinum needles of fairly large caliber that we now use, any amount can be obtained; and we now usually take 200 c.c. The serum recoverable amounts to 50 to 60 per cent. of the blood; and most of our later cases have been given 95 to 110 c.c. of the serum. I am bound to say, however, that, so far as our present experience goes, the smaller doses seem to be nearly or quite as effective as the larger ones.

The withdrawal of these amounts of blood and the reinjection of the

serum have absolutely no effect on the patients; they feel nothing and suffer nothing save the two needle pricks required. One case, as above stated, was an epileptic and had a seizure on each of the two occasions on which his blood was drawn; and one other, a strapping young man, did not like the sight of his own blood, and refused further treatment of the kind. Beyond that we had no objections and saw no contra-indications to the methods.

It goes without saying that both the venesection and the preparation of the serum and its reinjection must be done under the strictest asepsis. An assistant or nurse is not absolutely necessary; but it is better to have one or the other, more especially as the necessary sterilization of needles, syringe, tubing, and glassware takes time. We draw the blood into four large test-tubes, each one of which holds about 50 c.c. This takes from four to twelve minutes, in accordance with the pressure in the veins; sometimes we introduce a second needle into some vein near the first to expedite the flow. The filled tubes are then set aside to clot, carefully covered, and stirred from time to time with a sterile glass rod. In about fifteen minutes clotting is complete, and the tubes can be put in the centrifuge.

The ordinary centrifuge employed for urinalysis will not do, since its revolutions are entirely too slow, and the serum separation would take an hour or two; besides this, the ordinary tubes supplied with them are too small for this work. An electric centrifuge revolving at least 4000 per minute is required; it will carry the large tubes, and in twenty to thirty minutes separation is complete. The supernatant serum is then poured off into a suitable sterile vessel, and reinjected usually into the patient's other arm. For this last step of the process, the ordinary salvarsan injection apparatus can be employed; I use a large all-glass syringe and suitable connections with a two-way stop-cock, so that I can inject directly into the vein from the container.

One precaution is absolutely necessary; all the apparatus coming in contact with the serum must be cool. Hot apparatus, taken directly from the sterilizer, might cause the serum to coagulate.

SYPHILIS.

Chancre of the Lip. Neither the course of the infection nor the general measures to be employed are in any way altered by the accidental site of the initial lesion; yet the extragenital sclerosis is always of interest on account of its great liability to misinterpretation, and the great danger to the community that it involves. The patient shown in Fig. 40 was the only domestic in a family where there were several small children, and did some of the duties of nurse as well as the housework. The lesion was both undiagnosed and untreated until she came to the hospital; and it is quite impossible to tell what mischief she may have

wrought in the intimate relationships that were inevitable. Yet we were unable to keep her in the hospital more than a few days; as soon as her lip began to get better she went out, possibly to cause widespread infection during her approaching secondary stage. Such cases are infinitely more dangerous to the community, both as regards the chances of spreading the disease and the consequences that may ensue, than any case of smallpox or tuberculosis; and the dangers from a case of leprosy are infinitesimal in comparison. In former times, patients of this kind who applied for public aid in the Charities Department of New York City were committed as prisoners, and could not leave the hospitals until the physician in charge was satisfied that they were no longer actively dangerous to the community. It would be well if this procedure were reintroduced, provided the detention for treatment was exercised with common sense and discretion. The vast majority of syphilitics, I am convinced, remain syphilitics for the rest of their lives. Neither arsenic, nor mercury, nor iodine in any form, as we can use it in our cases today, prevents this. But, fortunately, they are



FIG. 40.—Chancre of lip. (Gottheil's case.)

not contagious forever, though we cannot tell the exact period at which they cease so to be. The Wassermann test, useful as it especially is when negative, gives us no help; it is positive in syphilitics that have long ceased to be dangerous to any but themselves. To keep syphilitics in our institutions until the blood test is permanently negative would mean to keep a large fraction of our population in the hospitals for all their lives. Yet this has lately been seriously asked of us by at least one charitable agency in New York City. The patients that receive charity treatment for the luetic infection should be detained until the primary and earlier secondary stages have passed, and until what in the judgment of the physician has been a sufficient amount of treatment has been administered. Of course, infective lesions may reappear later; but the foundation for a cure has been laid, and the community has been protected during the most dangerous period of the patient's infection.

Syphilis of the Internal Organs. The ordinary phenomena of syphilis, the lesions by which we recognize the advent of the disease, occur so

largely on the surface of the body where they are visible to the eye, or just beneath the surface and accessible to our touch, or in cavities that are open to direct examination, that it is small wonder that the deeper and less evident manifestations of the disease should largely escape our notice or be misinterpreted. Yet, *a priori*, it is very unlikely that a general infection that shows such marked phenomena in all the accessible portions of the body should spare the internal organs. There is abundant evidence that this does not occur, and that at the same time that the patient presents indubitable evidences of the infection on his skin and mucosæ, his other organs suffer, and some of them materially and even irreparably, from the effects of the specific poison. But the symptoms showing this are apparently so unimportant compared with the very evident local lesions from which he seeks relief, that they are apt to be passed over. The febrile reaction in early syphilis, which, in certain cases, I have seen attain an evening height of 104° F., means serious systemic involvement; the cephalalgia, rheumatic and osteoscopic pains may mean actual involvement of the meninges and joints in disease processes that may lead to permanent impairment of these structures; the larger bloodvessels and the heart may be damaged very early; and internists have learned to look to a luetic infection as the cause of a considerable portion of the affections that are later called to their attention; and it is quite impossible as yet to say how early in the affection the changes begin in the nervous structures that lead later to the manifestations of the symptoms that we recognize as evidences of tabes and paresis. There is no reason to think that the other internal organs escape damage; and the occasional recognition of an inflammatory process in the kidneys, lungs, liver, etc., in early syphilis, or of their effects later on in the disease is presumptive evidence that in their lighter forms they occur more frequently and are not recognized. The difficulties of diagnosis as to the specific nature of these processes were formerly almost insuperable; their symptomatology did not differ in any appreciable way from similar affections of non-luetic origin; but, with the newer methods now at our disposal, the chances of recognizing them are very much greater.

Visceral lesions occur in all stages of the syphilitic infection after it has become general; in the earlier periods of the disease they are of the acute hyperemic or inflammatory type, and do not differ in their phenomena from similar affections of non-luetic origin. Like the early lesions of the skin and mucosæ, they tend to run their course and get well, whether treated or not; and they usually are treated, since the early and vivid tissue reactions to the spirochete are usually so severe and so manifest on the outside of the body that treatment is not apt to be neglected. Later lesions of the internal organs, however, though more serious and lasting, may run an insidious course, with

symptoms so slight or resembling ordinary affections so closely that they escape recognition. Chronic inflammatory processes leading to degeneration of the cell elements and ultimate fibrosis, or to gummatous infiltration and cell destruction, may go on till extensive destruction has occurred.

A pregnant example in my own experience is a number of cases of so-called chronic rheumatism, lumbago, or what not, which, after lengthy and unavailing treatment directed at the supposed diseases, have yielded promptly to a short neosalvarsan or salvarsan course with some mercurial injections. Some of these cases had a history of previous syphilis and some had not; some had a positive and some a negative Wassermann reaction. As is the case with chronic gonorrheal affections of the joints and tendons, we still have, in some cases, to rely on the old "touchstone of treatment" before we can be sure of the luetic or non-luetic nature of these obscure affections.

The vascular system is probably the first of the body tissues to be affected when the syphilitic virus is disseminated through the body. The intima of the lymphatics and bloodvessels is first exposed to the action of the spirochete, and frequently suffers from its effects. The heart itself is more rarely involved, though a syphilitic peri- and endocarditis is described, and syphilitic myocarditis and gummata of the heart muscle occasionally occur. The symptoms present absolutely no characteristics to distinguish these conditions from similar ones due to other causes. The presence of other evidences of lues, or of a positive blood test, or of a definite history, with the absence of other causal agents, or infections, may at most lead us to suspect syphilis.

Affections of the bloodvessels, therefore, are very common, endarteritis, with various forms of vascular degeneration and obliteration or aneurysm, being part of the regular symptomatology of syphilis of the internal organs, and responsible for many of the phenomena of the disease. In the earlier stages of the infection, the vascular changes are inflammatory and obliterative; the vessels at the base of the brain and the coronary arteries seem especially prone to be damaged, so that cerebral and special nerve symptoms, and myocarditis with anginal attacks and even sudden death may occur. In late syphilis, gummatous endarteritis, especially of the larger vessels, is the characteristic lesion; and the weakening and undermining of the vessel wall consecutive thereon is so marked that it is admitted that more than one-half of all aneurysms, including that of the aorta, is due to this cause. In all these affections also the symptomatology presents little that is characteristic, and the diagnosis can usually only be a presumptive one, based on the absence of other infections or diseases, and on the presence of other symptoms of lues, past or present.

Next to the vascular, the nervous system is perhaps most frequently injured by the syphilitic virus. Conservative neurologists estimate

that at least 10 per cent. of all diseases of the nervous system are due to syphilis; and its scope as an etiological factor in affections of this class seems to broaden year by year. In a large proportion of these cases, however, the morbid phenomena are due to indirect causes, being the result of changes in the bloodvessels supplying the nerve tissues rather than to the direct action of the infective agent on these structures themselves. The cephalalgia and cranial-nerve affections so characteristic of early syphilis, the paralyses and epileptiform attacks that are among its rarer manifestations, the tabes and general paralysis now admitted to be due to syphilis in every case, are examples of the special damage that the luetic poison does to the nervous elements.

With the other internal organs, however, we are on less certain ground. There is an early syphilitic nephritis, undoubtedly, though few of us have ever recognized it, and it would be almost unknown were it not for the fact that the salvarsan disciples have called attention to it in the attempt to explain away the undoubted cases that have been noted after the use of that drug. Chronic nephritis and gummatous nephritis are occasional results of the infection, though usually only known as such on the postmortem table. There is no reason at all to doubt that the lungs, the liver, and the other internal organs suffer also from the early and late effects of the syphilitic poison.

The reason why we know so little of these affections is the arrangement of our hospitals and public medical services. There is no place in this country that I know of where there is a real syphilological service, no place where the student and the investigator can see all the various forms of syphilitic disease. There is a place or two, like the City Hospital in New York, where skin syphilis can be studied; but even there the disease in its primary stage goes to the genito-urinary and not to the dermatological wards. Eye syphilis goes to the ophthalmic ward, and throat syphilis to the laryngological; bone and joint syphilis is relegated to the surgeon and the orthopedist; heredosyphilis belongs in the obstetric and pediatric wards; and syphilis of the internal organs takes its chance in the wards devoted to general medicine. Some time in the future there will be a great syphilological division or hospital, where, with the help of specialists in all these various lines, all the manifestations of this protean disease can be studied. For it can be proven beyond a doubt that as a scourge of humanity, as a cause of morbidity and mortality, and as a social peril, the "great white plague" runs only a bad second to the larger "pox" that we have been considering.

The Luetin Reaction in Syphilis.—To Noguchi belongs the credit of first successfully cultivating the spirochete and differentiating it both culturally and morphologically. He has infected animals from these cultures, has recovered the spirochete from their tissues, and has proved the existence of constitutional syphilis in them by the blood test.

Later he devised a method of using these results for diagnostic purposes which is known as the luetin skin-test for syphilis. Its basis is the fact that living organisms suffering from certain chronic infections shows an altered reactivity to concentrated cultures of the organism infecting them, and also to extracts of tissues containing them. This condition the serologists call "allergy;" it is well known to occur after injections of foreign protein matters; and I have known it to occur after auto-serum injections.¹

Many attempts have been made in the past to elaborate a cutaneous vaccine test in syphilis, but without result. Thus, Neisser and Bruch used extracts of organs rich in spirochetæ; Tedeschi employed extracts of hard chancres; and Nicolai, Favre, and others, a glycerin extract of syphilitic livers which they called syphilin. Their results, however, have not been sufficiently constant and specific to be useful. The luetin test of Noguchi seems to have more promise; and it has been subjected to careful examination by Kaliski² and by Howard Fox.³

The isolation and culture of the treponema is a matter of great difficulty, and therefore almost all the trials that have been made have been done with material prepared by Noguchi himself; with the details of its preparation we shall not here concern ourselves. It is necessary to be very sure of the continued innocuousness of the reagent by means of animal inoculations and cultures before using it on human beings. A luetin rich in spirochete, preferably of as many different strains as possible, and as free as possible from irritant preservative or culture material is to be preferred. Each new preparation should be tried on a number of normal controls before being employed. It is injected with a fine hypodermic needle into the superficial layer of the skin until a small wheal is produced, 0.05 c.c. to 0.07 c.c. being used. A positive reaction is a markedly infiltrated papule over 8 mm. in diameter, which persists three or four days, or goes on to softening or pustulation. Small erythematous or slightly infiltrated areas are not the true luetin reaction. In severe reactions, when a pustule forms, it may increase to the size of a plum, and rupture or be absorbed; infiltration and pigmentation may remain for some time thereafter. A tardy form of reaction has been observed by Kaliski, occurring in a few cases of cerebrospinal syphilis and tabes. At the end of the usual period of observation, the reaction appears negative; but, after seven to ten days, a vesicle or papule appears. His conclusions are based on the observation of nearly 400 specific and non-specific cases, and are as follows:

In primary and in secondary syphilis, the positive results are so small as to render the test of little practical value. In 30 cases, most

¹ Gottheil, Auto-serum Injections, New York Medical Journal, April 4, 1911.

² Luetin Reaction, New York Medical Journal, July 5, 1913.

³ Journal of Cutaneous Diseases, August, 1912.

of them having active lesions, only 3, or 10 per cent., were positive; the Wassermann test, on the other hand, gave 80 per cent. of positive results. In active syphilis, then, when the tissues are extensively invaded by the organisms, the body has not entered into a condition of altered reactivity or allergy.

In tertiary syphilis, the test seems to have its widest and most useful application, though Kaliski's figures are not so favorable as those of some other observers. In 30 cases of tertiary lues, he got positive reactions in 19, 66 $\frac{1}{3}$ per cent.; the Wassermann was positive in 23 of these cases, 77 per cent. These figures are interesting, both from the point of view of a comparison of the two tests, and as a much needed indication as to the value of the blood test itself; as also the fact that 2 cases, one a malignant lues and the other a tertiary syphilitic with spinal symptoms, both the luetin and the Wassermann reactions were negative. The author considers the reaction of definite value in a number of cases; the individual is in a state of allergy in tertiary syphilis, and he hopes that by further purification of the reagent, and the incorporation into it of a greater number of strains of spirochete, the allergic reaction may be brought out in a greater number of cases.

In heredosyphilis, the luetin test was positive in but 1 case, while the Wassermann was positive in 5 of them. In tabes, in 32 cases, the Wassermann was positive in half of them, the luetin positive in but 3. In cerebrospinal syphilis the results were somewhat better; of 13 cases, 4 gave a positive luetin reaction, and 9 were negative. In 7 old luetics who had been well treated and had not recently shown lesions, the luetin tests were all negative, though 4 of them gave positive Wassermans. The author's final conclusions are that the test is of little value in the active stages of syphilis or in parasymphilitic conditions; in the tertiary stage, he regards it as a useful supplement and adjunct to the Wassermann test.

Howard Fox's investigations were equally inconclusive. He injected 100 cases, 49 of which were acquired syphilis. In 14 cases of active syphilis, the luetin reaction was positive in 6, or 43 per cent.; the Wassermann was positive in all of them. In 33 cases of tertiary and latent syphilis, luetin was positive in 17, 51 per cent.; it was negative in 14, and doubtful in 2 cases; the Wassermann was positive in 19, or 65 per cent., of these cases, negative in 10, and not performed in 4 cases. In 5 cases of tertiary and latent syphilis that had been well treated with mercury, 1 gave a positive and 4 negative luetin reactions; of 11 similar cases treated by one or more salvarsan injections, 3 gave positive and 8 negative luetin reactions. Dr. Fox hopes that the new test will prove of value where the Wassermann fails to give definite information.

From the practitioners' standpoint, however, the case seems very distinctly one of "not proven." Testing material that is so difficult

to obtain that only its originator can prepare it, and even skilled serologists have to get it from him, is certainly something entirely useless to the profession at large. The precautions to be employed are sufficient to neutralize its value, even if it were more readily obtainable. Finally, the diagnostic results have not so far been such as to recommend it. The conclusion is inevitable that, as at present presented to the profession, the luetin test is not of much value in the diagnosis of syphilis.



FIG. 41. —Tubercular heredosyphilis. (Gotthell's case.)

Tubercular Heredosyphilis. The rarer forms of the hereditary luetic infection are naturally generally undiagnosed or misdiagnosed; and especially is this the case when inflammatory phenomena, or those of local pus infections, to which the infantile skin is especially liable, complicate the picture. The case pictured in Fig. 41 is one in point. The impetiginous pustules or their results, some of which can be seen in the illustration on the nose and under the eyebrows, and the fissuring and crusting of the lips, gave the case a superficial resemblance to an impetiginous eczematous condition. There were distinct signs, however, of something more serious in the picture. Under the lower lip were dark-brown, fairly firm nodules, though pus infected; and palpation of the lips showed the existence of well-marked and circumscribed areas of distinct infiltration. These things never occur in ordinary eczema and impetigo; and the diagnosis was readily made and confirmed by the results of treatment. Many months' use of the ordinary anti-eczematous treatment had not affected the condition materially; the use of mercurials internally and externally soon removed all traces of the eruption.

Wassermann Results. That the serologists must adopt some standard method of reporting their results, so that they may be readily appreciated and compared with one another, has long been evident; but they are slow in coming together on the matter. A distinctly positive and a distinctly negative report has, of course, a very definite, though limited, meaning; for while it says yes or no, like a witness in the court, it gives us, when positive, no indication of degree or amount, and is almost useless to us for comparison with previous examinations or as an index of the results of treatment. Such adjectives as weak or strong mean little; and the various "pluses" that are now usually added are the merest makeshift in the attempt to make the report more definite and satisfactory. This was bad enough; but during the last year or two an additional element of confusion has been introduced. The Wassermann reaction is comparatively new, and is naturally being changed in method and improved all the time. One examiner may use only the older and rougher methods; another may employ the very latest antigens; while a third may use a special method that is all his own. So that now we get reports like this: Negative to the ordinary antigens, weakly positive to highly sensitized or to cholesterin antigens. A patient with such a report would get a simple negative one from an examiner using only the routine methods, or from one of the many drug-store and other uncontrolled places where the test is so frequently made. Finally, each examiner has his own method of recording results; and I have frequently been unable to make any satisfactory comparison between reports made by different persons on the same patient.

Heimann¹ has attempted to elaborate a plan for a more accurate reporting of this test. A brief recapitulation of the principles on which it is based will be useful in estimating its value. Antigen from syphilitic liver, guinea-pig's heart, or beef-heart is prepared in a solution of a determined strength; a 20 per cent. solution of inactivated serum of the patient, and a 10 per cent. solution of the complement from the unactivated serum of a guinea-pig, 1 c.c. of each, are poured together into a test-tube, and allowed to remain in a thermostat or a water bath for one hour at body temperature. If the serum contains the proper amboceptor, the antigen and the complement will be linked, and the reaction will be positive. To determine whether this has occurred, 1 c.c. of washed sheep's erythrocytes, a 5 per cent. suspension, and 1 c.c. of a solution of rabbit serum of known hemolytic titer, the rabbit having been immunized to the aforesaid red corpuscles, is added. The liquid in the test-tube becomes pink and opaque. The tube is once more subjected to heat of body temperature for one hour, and the reaction is complete. If the complement be not bound to the antigen by the human amboceptor, it will be free to link itself with the hemolytic

¹ Journal of the American Medical Association, May 1, 1910.

system, and hemolysis will occur. The object of the entire test is to determine what becomes of the complement. If it joins the system composed of antigen and human amboceptor, the reaction is positive; if it joins the system composed of sheep's red-blood cells and sheep's amboceptor, the blood laves, and the reaction is negative. Between the two extremes of total binding of the complement and total hemolysis there are infinite gradations, giving visual signs of opacity, translucency, or transparency, which each observer interprets into negative, which is simple, or varying degrees of positiveness, which depends very largely on the personal equation.

Heimann's idea is to introduce an arbitrary but definite figure scale. Each test-tube contains 1 c.c. of the 5 per cent. suspension of sheep's erythrocytes; in volume this is $\frac{1}{20}$ c.c. Either none of this, or a portion of it, or the whole of it, is hemolyzed in the test. If we can determine what fraction of this $\frac{1}{20}$ c.c. remains after the test is completed, a numerical ratio can be arrived at. After sixteen to twenty-four hours all surviving red-blood cells have descended in the tube, and, according to their number, the deposit is light or heavy. By using a pointed and graduated centrifuge tube for the test, a fair degree of accuracy in determining the amount of the surviving cells may be arrived at. He calls total hemolysis zero, and survival of the entire number of erythrocytes, $\frac{1}{20}$ c.c., as 100. This makes a scale by which a quantitative idea of the reaction can be arrived at. Thus, if there is $\frac{1}{40}$ c.c. of red-blood cells left, half the red-blood cells have been hemolyzed, and the reaction equals 50 per cent.; if $\frac{1}{30}$ c.c. is left, it equals $66\frac{2}{3}$ per cent. With accurately graduated tubes, a fair amount of accuracy can be attained. With more accurately calibrated and divided tubes, there would be no difficulty in doing this.

Thus, with percentage figures varying from nothing to 100, a numerical idea of the strength of the reaction can be given. If it is 0, the reaction is negative, and we have a clear wine-red fluid; if it is 100, the red cells are heaped up on the bottom of the tube, and the fluid above is pure white. If the test is positive but weaker, say 50, the cells are at the bottom, and the supernatant fluid, containing dissolved hemoglobin, is salmon-colored, pink, or red, according to its amount. The stronger the reaction, the greater the amount of corpuscles at the bottom, and the paler the color of the fluid above; the weaker the reaction, the smaller the mass of corpuscles and the deeper the color of the fluid. These differences expressed in figures as proposed become definite and objective instead of subjective and vague, as before.

The formula given by Heimann for the calculation of the percentage is the following: n equalling the reading of the tube, and x the desired percentage, the equation is:

$$\begin{aligned}\frac{1}{20} : \frac{1}{n} &= 100 : x \\ \frac{1}{20} &= 100 \\ nx &= 2000 \\ x &= 2000 n\end{aligned}$$

I do not feel competent to speak authoritatively as to the value of this special method of standardizing Wassermann reports, and I am not aware that it has been adopted by serologists generally. But it is very evident that a system of some sort must be established, and the sooner those working in this special line get together and decide the matter the better for our patients, for practitioners generally, and for themselves.

OBSTETRICS.

By EDWARD P. DAVIS, M.D.

PREGNANCY.

The Diagnosis of Pregnancy by Serum Reaction: Abderhalden's Test. In *PROGRESSIVE MEDICINE*, September, 1913, pp. 151-152, we gave an account of Abderhalden's serum test in the diagnosis of pregnancy. His discovery occasioned great interest among obstetricians and biologists and has been abundantly tested by many observers.

In the *Monatsschrift f. Geburtshülfe und Gynäkologie*, Band xxxviii, Heft 1, 1913, Abderhalden publishes a further communication on this subject. He draws attention to the part played by digestion in disposing of various ferments introduced within the body. During pregnancy, materials normally foreign to the blood are thrown into the blood-current from the placenta. The blood-plasma of the pregnant patient contains ferments adapted to the control of these foreign bodies. These ferments we recognize by allowing the extract of placenta to work through dialysis upon the serum of a pregnant patient. In the dialysate we find the products of metabolism from the albuminoid bodies of the placenta. The serum of patients not pregnant produces no result. If the optical method is used, peptone derived from the placenta is mixed in solution with the blood-serum of the patient, who is studied. By the use of the polariscope, we observe the action or failure to act.

Abderhalden refers to numerous authors who have observed this result, in accordance with these methods. Where the test has not given results, he believes that the method has not been properly followed. The principal mistakes in this method of diagnosis he considers are as follows:

1. The blood is hemolytic or has not been subjected sufficiently to the action of the centrifuge. It contains cells which vitiate the dialysis.
2. The materials used in performing the dialysis are not perfect. The membrane employed allows a trace of albumin to pass through, or transmits peptones in differing degrees.
3. The placenta is not free from substances which react with ninhydrin.

He draws especial attention to the importance of having the placenta absolutely free from blood, and free from materials which may produce a false reaction. He believes that chemical cleanliness, and aseptic and antiseptic precautions are imperative for the success of the test.

Wolff¹ obtained good results in 38 cases with the Abderhalden test; 19 of these were in patients not pregnant, 6 of whom had some pathological condition of the genital organs, not inflammatory; 2 had chronic inflammation of the pelvic organs; 2 carcinoma of the uterus; and 11 were male subjects whose serum was tested. In each of these cases, the reaction was negative.

Twenty-one pregnant patients gave positive results. Illustrating Abderhalden's precaution, 9 sera from patients not pregnant, where the serum had been allowed to stand twenty-four hours, gave a positive reaction, illustrating the passage of dialyzable material from the blood into the serum, and this material produced the characteristic reaction.

Williamson² applied the Abderhalden test to 50 patients at St. Bartholomew's Hospital; 20 were in the last three months of pregnancy, or had recently been delivered, and each gave a positive reaction; 30 were not pregnant, and gave a negative reaction. In 16 cases it was used for diagnostic purposes; 3 were suspected ectopic gestation, and, in one, the test was positive and operation revealed a gestation sac in the left Fallopian tube, with a broad-ligament hematoma.

A second patient was seized with acute abdominal pain and vomiting, with hemorrhage from the vagina, and a tender, indefinite swelling was found posteriorly on the left side of the pelvis. The test was negative.

At operation, a hydrosalpinx of the left tube, with torsion of the pedicle was removed.

A third patient had pain, vomiting and collapse, leading to a suspicion of ectopic gestation. The test was negative. The patient's symptoms disappeared, no abdominal pelvic condition could be found, and the patient has since remained well.

In 5 cases of abdominal and pelvic tumors of doubtful nature, the test was applied. In one patient with a fibroma of the uterus, the test was positive, and observation for a few weeks showed that the patient, in addition to her fibroma, was pregnant. Another patient was admitted with two abdominal tumors; in one, the uterus being enlarged to the size of a three months' gestation. The Abderhalden test was negative. At operation, the tumors proved to be an ovarian cyst and a uterine fibromyoma. In the case of an ovarian cyst, the test was negative, but in the case of uterine fibromyoma, suppurating cyst and pyosalpinx, the test was positive. When repeated more carefully, the test was negative.

In a young girl with symptoms of tuberculous pyosalpinx, the test was positive. At operation, there was no pregnancy, but bilateral tuberculous pyosalpinx.

In 2 cases in which chorio-epithelioma was suspected, the test was

¹ *Monatsschrift f. Geburtshilfe u. Gynäkologie*, 1913, Band xxxviii, Heft 4.

² *Journal of Obstetrics and Gynecology of the British Empire*, October, 1913.

positive. One of the patients died, and, at autopsy, the diagnosis was proved correct. The other patient passed from observation.

Two cases of pregnancy with chronic nephritis gave a positive reaction to the test, and this points to the possible value of the test in the toxemia of pregnancy. In two cases of tuberculous sepsis admitted to hospital, the test was positive. In one patient who, after a fright, suddenly developed chorea, the test was positive, and physical examination later showed that pregnancy was present. In one case in which the test was applied very early in pregnancy, it gave a positive result.

Williamson believes, from his experience, that the ferment in the serum of pregnant women, which is specific to placental albumin, can be demonstrated from the eighth week of pregnancy until ten days after delivery. He believes that the polarimeter is more reliable than the method by dialysis. The test requires the most scrupulous care in details, and is reliable only in the hands of an expert. The ferment is found only when chorionic tissue is present in the body. It seemed probable to him that the color reactions and optical effects produced by the test might be simulated under other conditions.

In line with Williamson's observations on pregnant patients having toxemia and subjected to the Abderhalden test, is the research of Foulkrod.¹ His work was undertaken with the belief that the relief of the toxemia of pregnancy might result from supplying antisyncytial bodies to the blood of the pregnant woman.

The endeavor was made to keep alive placental tissue in serum, and to test this tissue with the blood of the pregnant patient, the blood of a non-pregnant person, and powdered thyroid extract. The behavior of the cells of the placenta when brought into contact with blood-serum, and other bodies, was observed, and the research carried sufficiently far to indicate that complement reaction in the placental stage of pregnancy may be established by using antigen from placental tissue. The application of the principles underlying this research may also be applied to the study of cancer, as syncytioma is one of the most malignant forms of this disease.

At the meeting of the Obstetrical and Gynecological Society, of Bavaria (the proceedings are reported in the *Monatsschrift f. Geburtshilfe und Gynäkologie*, Band xxxvii, Heft 6, 1913), Polano called attention to the reaction of the blood-serum of the pregnant woman to materials from the organs of the fetus, showing that the placenta is not the only source of the substance in the test.

Engelhorn has used the test in 108 cases; in 60 pregnant patients from the fourth to the tenth month, with 49 positive, and 11 negative, reactions. In 48 patients who were known to be not pregnant, the test gave a positive reaction in 31, and negative in 17. These cases com-

¹ Surgery, Gynecology, and Obstetrics, November, 1913.

prised those having normal pelvic organs, prolapse, carcinoma, cysts, myoma, pyosalpinx, chorio-epithelioma, and puerperal patients.

Experiments were also made with serum from pregnant and non-pregnant patients upon coagulated material derived from carcinoma, ovarian tissue, and fetal liver; in some of these, a positive, and, in others, a negative, reaction was observed. The general result of his observations did not impress him with the accurate nature of the test.

Petri conducted experiments to ascertain whether the serum of pregnancy did not produce reactions with albuminoid bodies other than placental. These experiments gave a negative result. He then observed the reaction produced by placental albuminoid upon blood-serum in 7 cases of carcinoma of the cervix, one carcinoma of the body of the uterus, one hematometra, two pyosalpinx, three myomata, and one tubo-ovarian cyst. The tubo-ovarian cyst gave a positive reaction, as did also two of the cases of myoma, the patient being very anemic. One case of carcinoma of the breast, with return after amputation, gave a positive reaction. The others were negative.

He then tested sera from syphilitic patients, men and women. Among the women there was no pregnancy, recent labor, or abortion. All gave positive reactions with the Wassermann test. Some of the patients had received no treatment, and some had been treated. Some of the syphilitic women who had been treated for syphilis gave a positive reaction.

Henkel¹ draws attention to the possibilities of applying Abderhalden's principle in research to cases having pathological conditions of the genital organs. He describes an interesting case of a woman, aged nineteen years, who had suffered from dysmenorrhea, with profuse hemorrhage. When she entered the hospital, she had had bleeding and pain for some time, with slight elevation of temperature. There was not much anemia, the abdomen was sensitive, the uterus was not enlarged and in normal position, but not movable, because of a very sensitive and bilateral pelvic exudate. It was difficult to say whether inflammation of the adnexa or ectopic gestation was present. One c.c. of artigonin was injected, which caused the patient's temperature to rise above 102° F. The blood-serum was then taken and examined by dialysis, and in sixteen hours gave a blue-violet color. Pregnancy was diagnosed, ectopic in character. At operation there was tubal pregnancy on the right side and salpingitis on the left side.

Petri² has prepared dialysis capsules for serum experiments. Those must be selected which are impermeable for albumin, but permeable by peptone, at nearly an equal rate. After careful washing, the capsules are tested with serum and peptone solution. After dialysis from sixteen to twenty-four hours, a 1 per cent. watery solution of ninhydrin is

¹ Archiv f. Gynäkologie, 1913, Band xcix, Heft 1.

² Zentralblatt f. Gynäkologie, No. 7, 1913.

added to the dialysate and boiled for one minute. A violet-blue color indicates a positive reaction; no change, or a slight yellow color, indicates a negative reaction.

Wallis¹ has worked in the laboratory of chemical pathology at St. Bartholomew's Hospital to perfect the technique of the Abderhalden test. He draws attention to the necessity for accuracy in making the test and in preparing the materials.

As regards the reaction of ninhydrin, the amino-acids in a very small amount will give a positive result. All protein and protein-containing material, will, on dialysis, give the test. Hence, all proteins must be purified by dialysis before use. The materials used in the test may not be handled with the fingers, and pipettes must not be placed in the mouth, owing to the danger of contamination from sweat and saliva. As hemoglobin is a diffusible protein, hemolyzed serum cannot be used in the diagnosis of pregnancy. When accuracy can be obtained, the method is useful in the early diagnosis of pregnancy, the differential diagnosis between fibromyomata and pregnancy, and the diagnosis of chorio-epithelioma.

The test may give a false return in patients who have fever or marked cachexia. In 2 cases of tuberculous pyosalpinx, the test was positive.

Heaney,² in applying this test, found, when the placenta was not reboiled and retested just prior to the test, that the reaction was unreliable, that it was positive in syphilitic men, in women with tuberculous peritonitis and other pelvic disorders. When the placenta was made free from reacting substances, the test did not prove reliable, and the use of the same apparatus, under the same conditions, gave varying results.

Jellinghaus and Losee³ publish an interesting paper upon the subject, describing the method which they employed in making the test, and illustrating the apparatus for collecting blood from the median basilic vein, showing the centrifuge tube and needle connected by a curved glass tube. Their results are tabulated for purposes of comparison. Their experience leads them to believe that by the method of dialysis it is possible to distinguish between healthy pregnant and healthy non-pregnant cases. They found that, as their experience increased and their methods improved, the test became more accurate. They believe that other conditions than pregnancy will not cause a positive reaction. In all, 563 sera were tested from different individuals. They believe that, practically, the method should be called a test for the presence or absence of chorionic epithelia still capable of being washed into the general circulation. It might not always diagnosticate an ectopic pregnancy, for if the ectopic had been followed by tubal abortion and

¹ Journal of Obstetrics and Gynecology of the British Empire, November, 1913.

² American Journal of Obstetrics, September, 1913.

³ Bulletin of the Lying-in Hospital of New York, June, 1913.

hematocele, the test would not necessarily give a positive reaction. If the reaction were positive, it would not aid in differentiating between early intra-uterine pregnancy with diseased adnexa and extra-uterine pregnancy.

This test should be useful for diagnosing early pregnancy, especially in cases where pelvic examination is refused; in differentiating between uterine myomata and pregnancy; in diagnosing chorio-epithelioma; in diagnosing or excluding pregnancy; in nursing women with amenorrhea; in differentiating between pregnancy and other causes of amenorrhea; and in differentiating between pregnancy and the menopause, with enlarged uterus due to metritis. In other diseases in which ferments are formed, this method may prove valuable, and may also be of service in studying the toxemia of pregnancy.

Mayer,¹ from Sellheim's clinic in Tübingen, calls attention to the value of this test in studying the toxemias of pregnancy and abnormal conditions of the thymus and thyroid. His experience is distinctly in favor of the practical value of the method.

Porchownick² found the test accurate in 97 per cent. of normal pregnancies. In postmortem cases, 8 out of 10 reacted in ectopic gestation—87 per cent.

Lichtenstein, in Zweifel's clinic in Leipsic, Rübsamen, in Dresden, and Aschner and Lampé,³ from Halle, described their experiences with the test before the Obstetrical and Gynecological Society of Leipsic, and emphasized the importance of accuracy in technique. Abderhalden emphasized the reliability of the test if each point in the method was scrupulously carried out.

Maccabruni,⁴ from Mangiagalli's clinic in Milan, contributes an interesting paper upon the subject, with illustrations of tubes which he has devised for making the test, and its various appliances. His conclusions are distinctly favorable to its accuracy.

Freund⁵ had more satisfactory results with the optical method than with dialysis. Of 104 cases in which both methods were used, in 31 the results did not agree. In 3 cases of pelvic disease without pregnancy, a positive result was given. In using the optical method, it is important to use at least two placental peptones.

Parsamow,⁶ of St. Petersburg, does not consider the test specific, and tabulates the cases in which it failed. He does not describe his technique.

Schlimpert⁷ reports interesting results by testing the placenta and sera of various warm-blooded animals. In general, his experiments confirm the accuracy of the test.

¹ Zentralblatt f. Gynäkologie, No. 32, 1913.

² Ibid., No. 30, 1913.

³ Zentralblatt f. Gynäkologie, No. 23, 1913.

⁷ Ibid., No. 24, 1913.

² Ibid., No. 33, 1913.

⁴ Annali di Ostetricia, No. 5, 1913.

⁶ Ibid., No. 25, 1913.

The Most Favorable Age for Parturition. Richter and Heiss¹ have examined the statistics of 64,022 labors to determine the most favorable age of the mother for parturition. So far as the mother is concerned, the complications of pregnancy, such as placenta previa, eclampsia, and premature rupture of the membranes, increase in frequency after the twenty-seventh year. The mortality after the twenty-sixth year increases in proportion with the frequency of operative interference. The number of abnormal presentations and positions increases after the twenty-sixth year.

The length of labor remains practically the same in primiparae between the seventeenth and twenty-fifth years, but is longer before the seventeenth, and after the twenty-fifth year. Young primiparae and old primiparae furnished the largest number of cases of exhaustion requiring assistance. Also, complications in the delivery of the placenta were most frequent before the eighteenth and after the twenty-sixth year. After the twenty-sixth year, lacerations increased in frequency.

So far as the children were concerned, primiparae, between the ages of twenty-nine and thirty, gave birth to the largest and best developed children.

The Nutrition of the Mother during Pregnancy. Hauch² reviews recent works upon the nitrogenous metabolism of pregnancy, and finds that investigators have demonstrated that, in normal pregnancy, the mother retains nitrogen equal in quantity to that accumulating in the fetus and in the placenta. Under ordinarily good conditions of hygiene, the requirements of the fetus balance the mother's retention of nitrogen, so that there is no essential gain in the quantity which she retains. When the appetite of the mother is unchecked and is good, she will store up nitrogen in excess.

The Electrocardiograph in the Study of Pregnancy. Rübner³ gives an account of results obtained by this method in Franz's clinic, in Berlin. Eighteen patients, from the second month of pregnancy on, were studied.

It was interesting to observe that the blood-tension varied from 110 to 115, in but a few cases going above 115. From the curves taken by this instrument, he concludes that the growth of the uterus alters the position of the heart during pregnancy, and thus, to some extent, disturbs its action. There is evidence that the power of the ventricles is increased, and that the actual force of the heart is greater than normal during pregnancy.

The Duration of Pregnancy. Fraenkel⁴ has studied to determine the best method of computing the duration of pregnancy. If the question is raised as to whether pregnancy probably begins immediately after

¹ Zentralblatt f. Gynäkologie, No. 41, 1913.

² Archiv mensuelle d'Obstétrique, March, 1913.

³ Zentralblatt f. Gynäkologie, No. 13, 1913.

⁴ Zeitschrift f. Geburtshilfe u. Gynäkologie, 1913, Band lxxiv, Heft 1.

ovulation, or after the following menstruation, he believes that conception follows immediately after ovulation. He estimates that ovulation usually happens from fifteen to nineteen days after the beginning of the last menstruation, which brings the average duration of pregnancy to 265 days.

The Importance of Bacteria in the Vagina Before Labor. Traugott and Goldstrom¹ have examined 902 parturient patients to determine the presence of bacteria in the vagina before labor, and its result. These patients were examined through the rectum, so that the vagina was disturbed only to take its secretion for examination.

Of the 902 patients, 514 had no streptococci in the vaginal secretion, and, of these, 64, or 12.45 per cent., had a temperature during the puerperal period above 101° F.; 388 had streptococci in the vaginal secretion, and, of these, 10.5 per cent. had fever during the puerperal period.

In general, their results indicate that the mere presence of streptococci in the vaginal secretion before labor has no influence upon the puerperal state. If by injurious manipulation, operation or laceration, the streptococci find entrance to blood and lymph channels, infection may develop.

The Immunology of Pregnancy. Murray² reviews extensively the recent literature upon this subject. For practical purposes we are most interested in therapeutic inoculations.

Murray finds evidence that in the toxicosis of pregnancy, normal pregnant serum given by inoculation has a beneficial effect. He cites Mayer's cases of herpes, urticaria in pregnancy, herpes persisting after labor, and eclampsia, benefited by from one to three doses of normal pregnant serum, 10 to 20 c.c.

Freund had good results in uncontrollable vomiting and neuralgia, with rapid recovery after two doses of 24 c.c.; 3 cases of eclampsia after doses of 36 to 58 c.c., with rapid improvement.

Freund also treated 6 cases of eclampsia with freshly drawn horse-serum, with doses of from 20 to 80 c.c., and obtained excellent results.

Our knowledge upon the relation of the mother's blood-serum to the placenta is not yet sufficiently well digested to be accurately classified, but the subject is one of great importance and demands further study.

The Clinical Significance of the Urine in Pregnancy. Bailey³ reviews the work which has been done to determine the conditions of the urine in pregnancy, and its significance. He finds that low nitrogen secretion, and changes in the ratios of the nitrogen fractions, are present where there is liver degeneration in the toxemias of pregnancy. Where liver degeneration is produced by a number of toxic substances, it is invariably

¹ Zentralblatt f. Gynäkologie, No. 7, 1913.

² Journal of Obstetrics and Gynecology of the British Empire, February, 1913.
American Journal of Obstetrics, August, 1913.

accompanied by an increase in the total nitrogen excreted, but without important changes in the relationship of the various fractions to the total nitrogen.

It is probable that amido-acid deamination is produced chiefly by the tissues. Eclampsia and the præeclamptic state may occur without marked changes in the nitrogen partitions. He believes it probable that when the urine of parturient patients is collected and preserved by accurate methods used in laboratories, there will be no great change found in the nitrogen partitions in eclampsia, except a lowering of the total nitrogen, and changes in the various fractions, due to the diet and the amount of absorption.

The Changes in the Metabolic Viscera Caused by Pregnancy. This important subject is always a topic of interest, and during the past year a considerable number of papers upon the subject have appeared.

Opitz¹ did not find marked changes in the liver during pregnancy in healthy women. When the general condition of the patient passes from the physiological to the pathological, changes are present.

Neu and Keller,² in the Heidelberg clinic, conducted researches to determine the function of the liver during pregnancy. They found that the function of the liver during pregnancy was such that levulose is assimilated in greater quantities during pregnancy than in the non-pregnant.

Regarding the deposit of fat in the centre of the acini of the liver, the writers expressed no definite opinion.

In discussing this paper, Schickele had observed the same phenomenon but considers it of no practical importance.

The functions of the kidney have been recently investigated by Eckelt,³ in Franz's clinic in Berlin.

In pregnant patients suffering from dropsy, he finds that benefit follows a diet in which sodium chloride is included. He also finds that the kidney of pregnancy is often incompetent to dispose of a considerable quantity of water, and that in these cases an attempt at milk diet is not successful. He would limit the quantity of fluid taken by these patients. He believes the kidneys are in a condition resembling tubular nephritis, in which there is great edema and a large percentage of albumin. Under a diet from which fluid was largely eliminated, the patient's blood-tension diminished, and the edema gradually disappeared. The effect upon the action of the heart was also excellent.

The Test of the Function of the Kidneys by Phenolsulphonephthalein. Eichmann⁴ has used this substance to determine the function of the kidneys. To secure the most accurate results, it should be administered

¹ Zeitschrift f. Geburtshülfe u. Gynäkologie, 1913, Band lxxiii, Heft 2.

² Monatsschrift f. Geburtshülfe u. Gynäkologie, 1913, Band xxxviii, Heft 4.

³ Zeitschrift f. Geburtshülfe u. Gynäkologie, 1913, Band lxxiv, Heft 1.

⁴ Zentralblatt f. Gynäkologie, No. 6, 1913.

by intravenous injection. The patient is first catheterized, and then drinks 400 c.c. of water. Half an hour later 1 c.c. of the test solution is injected, and the patient is catheterized at three, five, seven and nine minutes, after the injection.

With the alkaline solution, the urine will give a red color, indicating the excretion of the test substance. The catheterization is repeated in an hour, and the test again made. The entire urine is then rendered alkaline, and, if necessary, sufficient water added to make one liter. This fluid is examined in a colorimeter, in which the fluid obtained is compared with a standard color solution.

By this method, Eichmann believes that uncomplicated cystitis, and pyelitis, may be differentiated from nephritis. Conditions of the kidney resulting from heart lesions may also be recognized.

In the *British Medical Journal*, November 15, 1913, Bell contributes a paper on The Internal Secretions in the Female, and their Function in the Economy. In his general discussion of the subject, the writer states that he has made researches which confirm the importance of the ovarian secretions in the implantation of the ovum in rabbits. He agrees with Fraenkel that the presence of the corpus luteum in the earlier stages of pregnancy is essential for the continuance of the pregnancy, and that its destruction may produce abortion.

The writer believes that, during pregnancy, ovulation continues, and that the internal secretions of the ovary are formed.

Seitz¹ believes that, during pregnancy, the thyroid, hypophysis, ovary, pancreas, and epithelial bodies, are all concerned in nitrogenous metabolism. During the second half of pregnancy, there is marked retention of albuminoid material. The quantity of urine is decreased, and there is increase in the amount of ammonia, creatin, the amido-acids, and some of the peptones.

In normal cases, liver insufficiency cannot be demonstrated. The thyroid, hypophysis, and those glands in the body which have to do with the coloring material, are all concerned in disposing of sugar; so too are the pancreas, epithelial bodies, and, to some extent, the ovary.

In the last six months of pregnancy, hyperlipemia is present, and, in many cases, there is a slightly diminished capacity to assimilate sugar.

He believes that the thyroid is increased in from 65 to 90 per cent. of pregnant patients, and that hyperthyroidism is present in 60 per cent. In 6.4 per cent., there is mortality from the action of nitrogenous poisons upon the heart, or general intoxication. When the thymus gland persists, it forms a dangerous complication. The anterior lobe of the hypophysis undergoes well-marked hypertrophy during pregnancy, and this is thought to have a bearing upon the growth of the uterus, and, in some cases, enlargement of the pelvis.

¹ Zentralblatt f. Gynakologie, No. 24, 1913.

Symptoms resembling acromegaly are often seen in pregnancy. Pituitrin obtained from the posterior lobe of the hypophysis increases uterine contractions.

The pigmentation of pregnancy may be assigned to the suprarenal bodies, and, in some cases, disturbances in assimilation. Excessive function in the ovaries produces osteomalacia, and the placenta must be considered as a gland having an internal secretion. The development and growth of the mammary glands are influenced by hormones.

Schickele, in addition to pituitrin, has isolated substances which produce uterine contractions from the ovary, corpus luteum, the uterus itself, the thyroid, mammary glands, liver, kidneys, spleen, fetus, placenta, blood-serum of the pregnant patients, and also of the umbilical cord.

Schlimpert examined the anterior and posterior lobes of the hypophysis to determine whether its secretion is increased during pregnancy. Such increase could not be demonstrated. The active principle of the gland itself seems to be confined to the posterior lobe, and adjacent portions of the brain furnished no such secretion. In the embryo, this secretion is present at ten weeks in the calf. In the human fetus, it is present after the sixth month. It unquestionably influences the development of the fetus.

Albrecht has investigated the relation between the secretion of the mammary glands and that of other glands of the body, and believes that the mammary secretion inhibits the function of the ovaries.

The Blood during Pregnancy. The condition of the blood during pregnancy is of importance as regards the safety of the mother and the nourishment of her child.

Fetzer,¹ from his investigations, concludes that during pregnancy the fetus assimilates iron given to the mother, and increases its development in proportion. If the mother's diet is diminished, she continues to nourish the child up to a certain point. When this limit is reached, the development of the embryo ceases. The amount of iron in the blood necessary for the vital functions of the embryo is not reduced by the mother's starvation for some time. Finally, however, it becomes exhausted and the embryo perishes.

Lindermann² has studied *the blood in relation to the hydrocarbons* during pregnancy. Fatty and lipid substances are increased in quantity. This is also true of amenorrhea without pregnancy. In some cases of obesity, this is also observed.

It is thought that the demands made upon the mother by the fetus cause fatty degeneration of some of her tissues, and that the internal secretions ordinarily prevent this in excess. In eclampsia, this fat content is diminished, the lipid bodies are increased, and also the free colostrin and lecithin.

¹ Zeitschrift f. Geburtshilfe u. Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

² Ibid., 1913, Band lxxiv, Heft 2 and 3.

THE PRESENCE OF CALCIUM IN THE BLOOD IN PREGNANCY. Linzemeier¹ confirms Kehr's observation that in pregnancy the blood contains an increased quantity of calcium.

By investigating the blood of birds, Linzemeier found that it is also true during the period that the birds are producing young. Clinical facts point out a relation between the internal secretions and the amount of calcium found in the blood.

Intra-abdominal Pressure in Pregnancy. Paramore² concludes, from his study of this subject, that the intra-abdominal pressure is raised in pregnancy in a considerable degree. The action of the abdominal wall and thoracic diaphragm is greater during pregnancy than in the normal condition. In stout, non-pregnant persons, intra-abdominal pressure is greater than in thin patients. In pregnancy, there is an increase in the tonic contraction of the transversalis muscles. The separation of the recti comes from spasticity and indicates increased pressure, and separation of the recti indicates a degenerative change in the transversalis, which is progressive until birth.

In the last weeks of pregnancy, the abdominal wall is stretched, the fundus of the uterus pressed downward and forward by the diaphragm, causing an increasing bulging. This causes the intra-abdominal pressure to grow less as pregnancy nears its termination. Another factor producing this result is the diminution in rate of the increase of the uterine volume. When the membranes rupture prematurely, as they often do in primigravidae, a diminution in the volume of the uterus results, and a fall in pressure occurs. Spasticity in the muscles develops and relaxation ceases, this process going on for some time before the recti separate. In well-developed women, intra-abdominal pressure is greater, as is blood-pressure also.

Blood-pressure in Pregnancy and Labor. Donaldson,³ from observations at St. Bartholomew's Hospital, concludes that in pregnancy there is no increase of blood-pressure, nor is there a fall immediately following delivery. The collapse sometimes following labor is thought to be due to overstimulation of a damaged heart.

In cases of albuminuria, the writer considers high pressure a protective mechanism to aid in the excretion of some toxin. In purely toxic cases, the pressure tends to fall quickly to normal after delivery. In proportion as the kidneys are involved, the pressure remains high. The rising blood-pressure, in spite of treatment, indicates the termination of pregnancy.

The Condition of the Heart and the Diaphragm during Pregnancy. Heynemann⁴ has studied the position of the heart and diaphragm

¹ Zentralblatt f. Gynäkologie, No. 26, 1913.

² Journal of Obstetrics and Gynecology of the British Empire, August and September, 1913.

³ Ibid.

⁴ Zeitschrift f. Geburtshilfe u. Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

during pregnancy by the *x*-rays in Veit's clinic, in Halle. He finds that at the end of pregnancy the diaphragm is pushed upward and the heart assumes a more than normally transverse position in the average patient, from the eighth month of pregnancy until the end. Individual differences occur in proportion to the development and stature of the individual. This produces increased action of the heart and difficult action of the heart as pregnancy proceeds. With the patient in good health, this does not become excessive. The respiratory movements are not much diminished in extent, and the altered position of the heart and diaphragm seems to assist in the better emptying of the chambers of the heart. A bend in the pulmonary artery is thought to be the cause of the murmurs often heard during pregnancy. They are stronger with deep expiration, or appear first while this is carried on. They usually disappear soon after the puerperal patient gets up.

Diseases of the Heart Complicating Pregnancy. Fellner¹ does not believe that heart lesions in themselves are a serious menace in pregnancy. The condition of the heart muscle is the important element. Cases of mitral stenosis often demand the most active treatment. The prognosis is to be based upon the condition of the heart muscle, and the dangerous period will be that of labor, whether at term or premature, and not necessarily the condition of pregnancy.

When compensation is established, abortion or premature labor should be carried out if the patient has in previous pregnancies suffered severely from heart lesions.

A history of pulmonary edema in a previous pregnancy is considered very significant. When compensation fails, pregnancy should be terminated, when medical treatment fails, or when other complications, as tuberculosis, goitre, or chronic nephritis, are present. In recurring endocarditis, it is better not to interfere actively, and this is also the case in hydrothorax and hydropericardium in the later months.

As regards the method of terminating pregnancy, that method should be selected which will give the patient the least disturbance, and, in estimating this, the blood-pressure is of value. When edema of the lungs is a complication, rupture of the membranes often aids the action of the heart. Here the amniotic fluid must not be allowed to accumulate rapidly, if it can be prevented, as the danger of collapse is greater. In terminating pregnancy, all painful and rapid methods, as version and immediate extraction, should be avoided. Extraction especially is often followed by very dangerous collapse. So, in some cases after Cesarean section, secondary shock develops.

If section be chosen, it should be performed before the patient has pains, and in early pregnancy vaginal section is useful. When a patient, in previous pregnancies, has been in danger of death, and usually is

¹ Monatsschrift f. Geburtshülfe u. Gynäkologie, 1913, Band xxxvii, Heft 5.

delivered by section, sterilization should be practised if the patient's condition permits.

Attention is called to the fact that, in some cases, failure of the foramen ovale to close may be present as a cause of heart disease. In 4 cases, fatty degeneration of the heart was present, and three of these died soon after delivery. These cases are rare in pregnancy, but indicate how fatal lesions of the cardiac muscle are in pregnant women. Lesions of the heart are often the cause of hypertrophy of the endometrium, resulting in menorrhagia.

Pankow¹ found, in examining pregnant patients, that murmurs could be heard in 49.2 per cent., and that valvular lesions of the heart existed in 8.2 per cent. Murmurs resulting from pregnancy were found in cases where enlargement of the heart toward the right was not present. The murmur itself was a late systolic sound. In his experience, pregnancy should be interrupted in cases of mitral stenosis, and in all heart cases where compensation begins to fail.

Neu, in the treatment of heart diseases during pregnancy, has found benefit from the intravenous injection of strophanthin. He believes that pregnancy should rarely be interrupted, and that patients having heart lesions should be advised not to marry. If the necessity for interrupting pregnancy arises, rapid and violent methods should be avoided.

Narcosis is often useful in lessening the suffering of labor, and delivery should be effected in the least forcible manner possible.

Fromme² had observed heart murmurs during pregnancy in 10 or 15 per cent., and in 20 per cent. of cases the action of the heart was slowed during the puerperal period. From 70 to 80 per cent. of patients having heart lesions go through pregnancy without distress. Of 100 labors among such patients, 98 proceeded smoothly; and of 100 pregnant patients suffering from heart lesions, but one died. The mortality of mitral stenosis embraces 75 per cent. of all pregnant patients dying from heart lesions. Complications are especially dangerous to pregnant patients having diseased hearts. Endocarditis, nephritis, pneumonia, tuberculosis, emphysema, catarrh, adhesions of the pleura and pericardium, kyphoscoliosis, abnormal conditions of the arteries, and obesity may all complicate heart diseases in pregnancy and greatly increase their gravity. The most important complication is degeneration of the heart muscle.

When patients are comfortable, no treatment is required, except attention to hygiene. If compensation begins to fail, medical treatment must be employed. If this fails, the pregnancy must be interrupted, and warning must be taken if the patient gives a history of failure of compensation in a previous pregnancy. Vaginal or abdominal incision is by

¹ *Zentralblatt f. Gynäkologie*, No. 22, 1913.

² *Ibid.*, No. 24, 1913.

far the safest method for ending pregnancy, because it produces the least disturbance and shock. If heart lesions develop rapidly during labor, the labor must be terminated in the least violent manner possible.

Diabetes Complicating Pregnancy. Calceoni¹ publishes an extensive paper upon this subject. He calls attention to polyhydramnios as a frequent complication.

The fetal mortality of children prematurely born is 91 per cent., and, where labor comes on at term, 30 per cent. The most frequent indication for interfering, when pregnancy is complicated with diabetes, is the presence of polyhydramnios. In the puerperal period, the mother is more than usually liable to infection from her lessened power of resistance.

A maternal mortality of 46 per cent. is not considered an excessive estimate. The prognosis is always uncertain through the danger of acute acidosis and toxemia.

Bentlin² has studied the question of liver insufficiency complicating pregnancy. He finds that disturbances in the metabolism of carbohydrates complicating pregnancy are usually very slight in degree. The influence of internal secretion he believes is of importance. Toxemia and eclampsia naturally interfere, and result from abnormal action of the liver. Eclamptic convulsions produce an increased quantity of sugar in the blood. All evidence points to disturbance in the functions of the liver as a frequent cause of eclampsia.

Affections of the Urinary Tract in Pregnancy. Croom³ opened a discussion upon this topic before the British Medical Association.

As regards the presence of SUGAR IN THE URINE, he states that it occurs in about 5 per cent. of all pregnant women. Glycosuria is comparatively rare, the alimentary form being more easily produced, and there is often a transient glycosuria during the last weeks of gestation. In true diabetes, glucose, diacetic acid, and acetone are present, and often albumin.

In making a prognosis, it is important to remember that when pregnancy complicates a preëxisting diabetes, the prognosis is grave. A glycosuria which does not respond to treatment is virtually diabetic. When sugar is present as a result of alimentary disturbance, the prognosis is less grave.

Sterility is often observed in diabetic patients, and premature labor occurs in 50 per cent. The maternal mortality he places at 50 per cent., 30 per cent. dying in coma; as for the children, 51 per cent. are stillborn and 10 per cent. die within a few days after birth.

As regards *treatment*, if the cases do not yield to diet, and acidosis, albuminuria and acetonuria supervene, pregnancy must be interrupted.

¹ Annali di Ostetricia, Nos. 2 and 5, 1913.

² Monatsschrift f. Geburtshülfe u. Gynäkologie, 1913, Band xxxvii, Heft 3.

³ British Medical Journal, October 19, 1913.

In early pregnancy, nothing is gained by waiting for viability. The danger in interrupted pregnancy lies in the development of coma. In labor, the patient should be spared muscular strain as much as possible, as muscular strain may precipitate acidosis. Chloroform should not be used. An intravenous injection of sodium carbonate, a teaspoonful to the pint, is advised.

In two cases of HEMATURIA COMPLICATING PREGNANCY, the condition was caused by congestion of the vesicomucosa. This gradually subsided after labor.

Williamson reviews the PYELITIS OF PREGNANCY, and draws attention to the fact that the absence of leukocytosis does not exclude the presence of pus in the kidney. He described a case in which the leukocytes were 8200, and in which the patient had a severe and typical bacillus coli communis infection of the kidneys.

In *treatment*, he advised absolute rest in bed, the patient lying on the side opposite to that infected, so that the uterus may fall away from the pelvic brim and allow free drainage of the kidney. A light diet, largely of milk, the free use of water, with potassium citrate, urinary antiseptics, and free purgation, should be given. Serums have proved useless, and autogenous vaccines are not reliable. If the patient does not improve under this treatment, pregnancy must be terminated.

Nicholson believed that, in eclampsia, there was a powerful vasoconstricting substance obstructing the blood much resembling adrenalin. This caused contraction of the vessels, particularly in the kidney, reducing its flow of blood, and greatly interfering with the secretion of urine.

Postmortem appearances found in the kidney, liver, lungs, spleen, and eclampsia, he ascribed to intense venous congestion from the cutting off of the arterial blood-supply. There is some ground for believing that adrenalin may be the substance which produces this result.

The Toxemia of Pregnancy. ECLAMPSIA is now so universally considered as a phase of toxemia that the latter has largely taken the place in obstetric literature formerly occupied by eclampsia.

In the *Journal of Obstetrics and Gynecology of the British Empire*, April, 1913, Corbett studied the *excretion of starch digesting ferments during the toxemia of pregnancy*. He divided the cases of eclampsia into two main groups—those primarily renal, and where the toxin attacks the renal epithelium. To test the action of the kidneys, diastase is given, and, if the kidneys are involved, but a small quantity will be excreted, while albumin will be present in considerable amount. In the blood-serum, the diastase might be in greater quantities than in the urine.

In the type of eclampsia in which changes in the liver and pancreas are found, the percentage of diastase in both the urine and serum will be high, while albumin will be present in a large quantity.

In the rare cases in which there is no albuminuria, the administration of diastase may prove a valuable aid in diagnosis.

Sperling¹ reports a case of pernicious nausea which seemed to be due entirely to retroversion of the uterus, and this in the puerperal period, after pregnancy had been interrupted because of pernicious nausea. The patient was first benefited by the original operation, and then grew much worse. At the second operation, the uterus was replaced in normal position, and very lightly curetted to cause contraction of the uterine muscle. A good result followed.

Blood-pressure has latterly been assumed so important in estimating the degree of toxemia present that Lynch's² paper on BLOOD-PRESSURE DURING PREGNANCY is of practical importance.

In 100 private cases in which at least four observations were made upon blood-pressure during pregnancy, the average systolic was 104.6 mm. of mercury, with variations between 78 and 145. If the various cases are placed in groups, we find 35 per cent. below 100; 43 per cent. between 101 and 110; 13 per cent. between 111 and 120; 8 per cent. between 121 and 145.

During the puerperal period, the average systolic reading was 124, with variations from 105 to 146. The average in the puerperal period was far higher than among patients observed during pregnancy. These observations are sustained by those of others, so that we may conclude that, during pregnancy in normal patients, the pulse tension is comparatively low.

In cases of eclampsia, the writer has twice met with cases in which eclampsia developed in women who had normal blood-pressure during pregnancy. In a fatal case of eclampsia without convulsions, the blood-pressure did not rise above 100. In the second fatal case, the blood-pressure was 85.

From these and similar reports, it is impossible to place absolute reliance upon blood-pressure as a sign of acute toxemia or threatened eclampsia.

Freund³ has treated various manifestations of the TOXEMIA OF PREGNANCY WITH SERUM AND WITH RINGER'S SOLUTION. Ringer's solution is essentially sodium chlorate, calcium chlorate, potassium chlorate, sodium bicarbonate, and distilled water.

Ringer's solution was given two or three times subcutaneously, in doses of about 200 c.c. Some prefer Locke's solution, which contains sodium chlorate, calcium chlorate, potassium chlorate and sodium bicarbonate, in different proportions from those in Ringer's solution.

The serum employed was obtained from horses or from the human subject, and was given in doses of 20 c.c.

¹ Zentralblatt f. Gynäkologie, No. 2, 1913.

² Surgery, Gynecology, and Obstetrics, October, 1913.

³ Zeitschrift f. Geburtshilfe u. Gynäkologie, 1913, Band lxxiv, Heft 1.

Freund reports 3 cases in which lesions of the skin were a prominent symptom of toxemia. One, prurigo and urticaria; one, a much aggravated erythema; and one of exanthem resembling urticaria. In these cases there was albuminuria, and the diagnosis of the toxemia of pregnancy was evident.

These patients were treated by injections of serum, repeated several times, the dose each time varying from 24 to 40 c.c. Each patient made a good recovery. One of the cases was complicated by pernicious nausea and icterus.

Three cases of eclampsia are reported, treated by injections of human serum, the dose varying from 36 to 58 c.c. These patients also recovered.

Freund also reports 4 cases of skin lesions complicating toxemia, treated by serum obtained from horses. The first patient had given birth to twins, and suffered much from an exanthem over the entire body. On the sixth day of the puerperal period, she received an intravenous injection of 25 c.c. of fresh horse-serum. In twelve hours she had an intense reaction, with chill, high fever, and headache. The itching and burning ceased, and within twenty-four hours rapid improvement occurred, which went on to recovery. In two weeks after the injection the skin was normal.

In the second patient, in the eighth month of pregnancy, prurigo was present in an extensive degree, with intense itching; 30 c.c. of fresh horse-serum was given by intravenous injection, followed by no reaction, but gradual improvement and recovery. Labor came on spontaneously, with a living child, and the puerperal period was normal.

In the third case of herpes, an intravenous injection of 30 c.c. of fresh horse-serum was followed by recovery. The patient went home and had three returns of the herpes in a less degree, but came into spontaneous labor and gave birth to a full-term living child, who had a cutaneous eruption.

A fourth case of toxic exanthem with pemphigus, which had caused intense irritation, loss of sleep and prostration, was treated by 28 c.c. of fresh horse-serum, given by intravenous injection. This produced a gradual but complete recovery.

He also reports 6 cases of eclampsia with recovery and a normal puerperal period, the dose in one case being 20 c.c.; in a second, 116 c.c., given subcutaneously; in a third, 75 c.c., given in the vein; in a fourth, bleeding, 300 c.c., followed by an injection of 40 c.c. of horse-serum; in a fifth case of postpartum eclamptic bleeding, 20 c.c. was followed by intravenous injections of 45 c.c. of horse-serum; in the sixth case, 28 c.c. of horse-serum was given by intravenous injection. All of these patients recovered.

In using Ringer's solution, subcutaneous injection in both thighs was practised, 150 c.c. in each.

In 9 cases of skin lesions complicating pregnancy, this remedy was

used with excellent results, the dose varying from 150 to 220 c.c. Two cases of pernicious nausea are reported as greatly benefited by an injection of this solution.

The writer sums up cases reported by others, and finds 13 cases of lesions of the skin complicating pregnancy treated by the serum of pregnant human beings. The 13 cases recovered, 7 having no relapse, and 6 after relapse; 18 cases were treated by horse-serum or by Ringer's solution, with recovery—5 without relapse, and 13 with relapse. One case reported by Rubsamen received both Ringer's solution and the serum of the human pregnant patient without recovery.

In pernicious nausea, counting his own cases, he finds 6 patients treated with the serum of pregnancy, 2 of whom were not improved; with horse-serum, 2 cases which recovered after relapse, and with Ringer's solution, 2 cases which recovered without relapse, a total of 10, with 8 recoveries. In eclampsia, the total is 12 cases, with 10 recoveries and 2 deaths.

As the thyroid gland is implicated in many cases of the toxemia of pregnancy, Markoe's¹ report of 35 cases in which enlargement of the thyroid was present, is of interest. In reviewing his entire records, 83 cases of thyroid enlargement, or 9.7 per cent., in primiparæ have been observed, and 49 cases, or 6.7 per cent., in multiparæ—a general average of 8.3 per cent.

The study of these individual cases showed a great diversity as to the time when the thyroid became enlarged, and the relation which pregnancy and parturition bore to the condition of the thyroid.

White² had an opportunity to study by postmortem the body of a primipara who had a small goitre for sixteen years which had suddenly increased in size when she was six months pregnant. Labor was spontaneous, but, on the following day, bronchitis developed, followed by dyspnea, cyanosis, and death. The thyroid, thymus, kidneys, suprarenals, ovaries, and pituitary gland were removed for investigation. The thyroid was regularly enlarged and solid, except for one cyst 3 cm. in diameter on its posterior aspect. There was no hemorrhage into its substance. The thymus formed a loose, tongue-shaped mass 11 cm. by 2 by 1 cm. The remaining cases showed no essential alteration.

Upon microscopic examination, the alveoli of the thyroid varied greatly in size, in places resembling the condition known as colloid goitre.

Hofmann³ has studied the condition of the blood in parturient women having normal and altered thyroid conditions. He finds that, in pregnant patients with normal thyroid, the coagulation time of the blood is somewhat shortened.

¹ Bulletin of the Lying-in Hospital of New York, June, 1913.

² Journal of Obstetrics and Gynecology of the British Empire, November, 1913.

³ Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxv, Heft 2.

In pregnant patients with large, vascular and soft thyroids, the coagulation time of the blood is normal. In pregnant patients in whom the thyroid is deficient in size or development, the coagulation time of the blood is shortened below the normal average. During labor, the coagulation time of the blood is shortened in 50 per cent. of the cases, and there is no difference in the various thyroid conditions. In the puerperal period, the coagulation time of the blood is greatly lengthened and approaches the normal, and here again the thyroid condition had no influence. Normal pregnancy shows a very slight leukocytosis, and in pregnant patients with excessive thyroid secretion in about 40 per cent. of cases there is a slight absolute and relative lymphocytosis which disappears after labor, and again returns in the puerperal period. With those patients deficient in thyroid activity, this is absent. The freezing point of the blood in pregnancy is somewhat higher than that of the blood in the non-pregnant. In pregnant patients with excessive thyroid development, this is not the case. Switzerland has long been considered the home of goitre, and the Canton Bern shows a high percentage.

Müller¹ finds that in this region women are more predisposed to goitre than men, and that 7 per cent. of women having this condition refer it to the development of puberty. In 10 per cent. of all women observed, the neck increased in size during menstruation. In pregnancy, primiparae showed parenchymatous globe-like and vascular development of the thyroid. Repeated pregnancy increases the tendency to cystic and nodular changes in the thyroid. In 57 per cent. of parturient women the swelling of the thyroid disappears during the puerperal period, and this is most strongly marked in vascular tumors. Parenchymatous and nodular cystic thyroids often undergo marked reduction in size. In 7 per cent. there is no change in the swelling of the gland in the puerperal period, but a permanent enlargement may be traced to the occurrence of pregnancy and labor.

Functional disturbance of the heart is not common among these patients during pregnancy. If the patient has a sound heart, the condition of the thyroid seems to have no special influence. There is in the Canton Bern a relationship between contracted pelvis and endemic goitre. The justominor or symmetrically contracted pelvis is found in regions where goitre is especially prevalent. Cretins are not disposed to this form of pelvic contraction.

THE TOXEMIA OF PREGNANCY AND EUGENICS. Roth² alludes to recent studies in the chemistry of the internal secretions in pregnancy, and in the ferments furnished by the placenta and secretions of the internal glands. He believes that the advance in our knowledge of the causes for the mortality and morbidity of childbirth must come from such research. He states that over 3000 women die every year in

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxv, Heft 2.

² British Medical Journal, July 5, 1913.

England and Wales from puerperal septic disease and accidents of childbirth, and that in one year 99,430 infants died during their first year of life, with 19,000 stillbirths in addition. These statistics are given to show the need for the lessening of mortality and morbidity accompanying and following parturition.

In the interests of the race he urges the care of the women during pregnancy, and better hospital accommodations during labor.

THE RELATION BETWEEN PERNICIOUS NAUSEA OF PREGNANCY AND ACUTE YELLOW ATROPHY OF THE LIVER. In the *Archiv für Gynäkologie*, 1913, Band xcix, Heft 3, Heinrichsdorff publishes the results of his study in these cases in autopsies and examination of the various organs. His studies lead him to conclude that pernicious nausea is the typical disease of the first half of pregnancy, extending over weeks and months, with great loss of weight. It is impossible to find a pathological condition in any one organ to account for this disorder. Most cases terminate in recovery. In rare cases of pure pernicious nausea, death occurs, and autopsy finds no definite cause for the fatal termination. We recognize, during pregnancy, eclampsia and acute yellow atrophy of the liver as intoxication, and manifestations of this condition are described as parenchymatous degeneration of the liver, acute hemorrhagic nephritis, and toxic icterus. This intoxication may develop in a person previously healthy or in a patient already the victim of pernicious nausea. In pernicious nausea, it is occasionally observed that some patients suddenly grow worse, with an essential change in the entire aspect of the disease. In cases of pernicious nausea, autopsy fails to demonstrate the precise intoxication present. There seems to be no relation between the duration of the pernicious nausea and the lesions found in various organs. In some cases of acute intoxication of pregnancy, there has been no pernicious nausea. He believes that pernicious nausea does not arise from intoxication, but that it may proceed to a condition of intoxication. This is shown by the fact that so few patients die of pernicious nausea only, the fatal cases being those that have developed as acute toxemia.

Rubeska¹ has treated two cases of pernicious nausea in pregnancy with normal pregnant serum. The first case was terminated by the interruption of pregnancy, as the injection of serum produced very little result. In the second case, a similar experience occurred.

It is impossible to report, in these cases, that the serum proved of special value.

Pregnancy and Tuberculosis. Stutz² operated upon 15 tuberculous pregnant women, in 14 through the vagina, and, in one, through the abdominal wall, to produce sterilization by the excision of the Fallopian tubes.

¹ *Zentralblatt f. Gynäkologie*, No. 9, 1913.

² *Zeitschrift f. Geburtshilfe und Gynäkologie*, 1913, Band lxxiii, Heft 2

In cases of young women in fairly good condition, with the hope of recovery from tuberculosis and future childbirth, the pregnancy was interrupted by dilatation and gauze packing of the uterus. The result of the operations for sterilization was good. Many cases showed rise of temperature and irritation of the pleuræ, which subsided without serious consequences. The patients got up on the eighth day, and were speedily convalescent. He was able to keep track of most of the patients so treated, and good reports as to the general health were given.

Schmidt¹ operated upon 37 cases of peritoneal and genital tuberculosis not complicated by pregnancy. Among these, 12 died—3 from extensive tuberculous lesions in the peritoneum and genital organs. In the 25 which survived the operation, the general health was improved in 17. In 14 tuberculosis attacked other organs.

A comparison of these results with those obtained by operating upon pregnant women affected with tuberculosis indicates that operation is of more value in the pregnant than in the non-pregnant.

Werner² reports 60 patients between six weeks and five months pregnant, operated upon by dilating the cervix with solid dilators, incising transversely the anterior vaginal wall about the cervix, pushing upward the bladder, and splitting the anterior lip of the cervix above the internal os in the median line. The ovum was loosened from its attachment by the finger, and removed by the finger and placental forceps. The edges of the cervix were closed and the peritoneal cavity opened. The Fallopian tubes are then drawn down without disturbing the uterus, and a piece removed from the uterine extremity of the tube. When possible, the entire tube is drawn down and removed. The lines of the incision are then closed by suture, and a small drain left in the prevesical space.

These cases were not those of active tuberculosis of the lungs or larynx, but where the disease was more sluggish, and the patient in fair condition and without other complications. In but 8 of the patients were there complications following the operations.

To lessen hemorrhage from the uterus, pituitrin and ergot were given at the beginning of the operation. In 10 cases, it was necessary to tampon the uterus. In one case of pregnancy of two and a half months, uterine hemorrhage was so profuse that vaginal extirpation was performed. One patient died an hour and a half after operation. She was in advanced tuberculosis and three months pregnant. Profuse hemorrhage followed emptying the uterus from lacerations of small vessels in the region of the bladder.

On the average, convalescence after the operation requires eight or nine days. In three cases, examination during convalescence showed an exudate around the stumps of the Fallopian tubes; 29 of the cases

¹ *Zeitschrift f. Geburtshilfe und Gynäkologie*, 1913, Band lxxiii, Heft 2.

² *Zentralblatt f. Gynäkologie*, No. 43, 1913.

were done over a year ago, of whom one died four months after the operation from pulmonary tuberculosis. Twenty-four sent personal reports, of whom 20 were in good general health and able to work, and had gained in weight. Some reported cough and night-sweats, with fair general condition. Four complained of weakness, with malnutrition, severe cough with expectoration, sometimes blood-streaked, and also with diarrhea; 7 had profuse menstruation since the operation, of whom 5 had suffered in a similar way before they were operated upon.

Bardeleben¹ reviews recent papers bearing upon tuberculosis complicating pregnancy, and concludes that when the tuberculous process is latent, inactive, or has gone on to healing in the lungs, there is no indication for interrupting pregnancy. Such patients should be kept under observation, especially in the later months of pregnancy, when the disease may become active. The general treatment for tuberculosis is indicated with these patients. Where, however, the disease is active, pregnancy should be interrupted, and in cases of tuberculosis of the apices of the lungs with the patient in fair general condition, and pregnancy not beyond the fourth month, it is sufficient to bring about the emptying of the uterus. In cases in which the tuberculosis has proceeded further, the interruption of pregnancy is not sufficient, and the results for the mother are worse than if pregnancy had remained undisturbed. In these cases, not only must the embryo be removed from the uterus, but the placental site should be extirpated through the resection of the body of the uterus—a proceeding which very much improves the prognosis for the mother.

The writer declines the interruption of pregnancy, by the introduction of bougies or the gauze tampon, as being too uncertain to be of value.

In this connection, Sellheim's paper² on the interruption of pregnancy and sterilization at one sitting, by the abdominal route is of practical interest. When disease of the lungs, heart, kidneys, or other organs, makes the interruption of pregnancy imperative, the operator should avoid repeated narcosis and repeated operations. These cases demand not only the interruption of pregnancy, but the prevention of subsequent conception.

His method consists in opening the abdomen, excising and removing the tubes, incising the uterus at its fundus transversely, grasping it open with tenaculum forceps, and separating and removing the ovum with the gloved finger. The cervix is then dilated by passing a solid bougie, and a strand of gauze is passed through the uterus into the vagina. The uterine cavity is tamponed with gauze, and the uterus is closed.

By this method, he has operated upon ten patients from the first

¹ *Zentralblatt f. die gesamte Geb. und Gyn.*, 1913, Band I, Heft 1.

² *Monatsschrift f. Geburtshilfe und Gynäkologie*, 1913, Band xxxvii, Heft 2.

to the fifth months of pregnancy, recovery following without complications.

Blighted Pregnancy (Hydatidiform Mole). Ferguson¹ reports the interesting case of a multipara who, while in early pregnancy, was frightened and hastily jumped out of a cart. To this accident she ascribed the development of her illness.

There was bleeding in gushes from the vagina, swelling in the abdomen, swollen feet, and prostration, and a physician found her suffering from acute dilatation of the heart, with hemorrhage. An abdominal tumor extended nearly to the umbilicus, and there were symptoms of obstruction of the bowels.

Upon examination, the patient was very ill, there was a hard, slightly tender swelling in the abdomen to the right of the middle line, reaching above the umbilicus, the cervix was hard and like cartilage, and the external os very small. There were small fibroid tumors in the lower uterine segment. No evidence of fetal life could be obtained.

The patient was at once taken by motor car to the nearest hospital and the uterus removed by supravaginal hysterectomy. The ovaries were left. The patient was aged forty-nine years, and there was about two quarts of free fluid in the abdomen.

The specimen was hardened and subjected to examination, and found to be a hydatid mole, the uterus having uniformly expanded by the growth, and some small fibroid tumors.

Upon microscopic examination there was no evidence of invasion of the uterine muscle of a malignant nature.

Ballantyne² reports the case of a patient brought by motor car to the Royal Maternity Hospital, Edinburgh, suffering from hemorrhage and in a dying condition. A few moments after admission the patient died.

She was aged forty-seven years, a multipara, and on the preceding day had a cramp-like pain in the abdomen, followed by severe vaginal hemorrhage. Her physician removed clots from the vagina, when the bleeding stopped, but returned during the night. Tampons of cotton-wool were then used, and the patient brought to the hospital.

The history was one of three months' pregnancy, but the uterus corresponded to seven months. Protruding from the cervix was tissue which contained watery vesicles, enabling the diagnosis of hydatid mole to be made.

At autopsy, the remaining organs were practically normal.

Upon opening the uterus, there was no evidence of a fetus, the uterine wall was thinned, the internal surface ragged and eroded. There were masses of semiliquid blood throughout the tumor. At the lower portion, the mole was not covered by membrane, and its exposed surface pro-

¹ *Journal of Obstetrics and Gynecology of the British Empire*, August, 1913.

² *Ibid.*

jected into the cervix. From this the fatal hemorrhage had occurred. No invasion of the muscular coat was found by chorionic villi.

Pregnancy and Diseases of the Kidneys. *Infection of the kidneys*, usually with the bacillus coli communis, is not an infrequent complication of pregnancy, and may accompany infection of the appendix and gall-bladder by the same germ.

Schellfizek¹ describes the case of a girl, aged eighteen years, brought to the hospital in a very anemic condition, weighing but 91 pounds. She gave a history of having had an illness of four weeks' duration during her twelfth year, from inflammation of the intestine. Since this she had had six other attacks.

Upon examination, there was tenderness on the right side of the lower abdomen. The uterus was retroflexed, but the pelvic organs otherwise normal. There was a slight rise of temperature in the evening, the urine was discolored, and the patient was examined by the cystoscope, when a small quantity of pus was seen emerging from the left ureter. When pressure was made on the left kidney, the pus came abundantly, and when the functions of the kidney were tested the left kidney was almost without function. The patient gave no history of pain in the bladder, and the right kidney was subsequently removed. The patient made a speedy recovery, and improved greatly in health. The kidney was thickened, with fibrous tissue, and contained numerous small abscesses.

Another patient, aged twenty-three years, was also found to have infection of the left kidney, which was removed. In neither of these cases were typical bacilli found, both patients making complete recoveries.

The third case was a woman, aged thirty-three years, who had had three children. For retroversion she had shortening of the broad ligaments, but before this operation she had suffered from catarrh of the bladder, and this persisted.

Upon examination, some obstruction was found in the right ureter, and from this was obtained a small quantity of very alkaline urine. From the left kidney, the urine was clear and acid. Pyonephrosis from calculus was diagnosticated. The patient declined operation, but submitted to examination by the x-ray, when the presence of the stone was clearly recognized.

Albrecht² believes that *the use of the ureteral catheter and irrigation of the pelvis of the kidney* have greatly lessened the employment of other forms of treatment in the *pyelonephritis of pregnancy*. He describes the history of a patient, aged twenty-two years, six months pregnant, who had chills, vomiting, and pain in the left side of the back, with constipation and difficult micturition. Nephrotomy was performed,

¹ Zentralblatt f. Gynakologie, No. 27, 1913.

² Ibid., No. 9, 1913.

showing great hyperemia of the parenchyma of the kidney, the pelvis of the kidney distended, and very cloudy urine.

The patient was not improved by the nephrotomy. Upon examination with the cystoscope, the mucous membrane of the bladder was reddened and swollen. Both ureters were permeable to the pelvis of the kidney; from the left kidney bloody urine escaped, and from the right cloudy urine in a smaller quantity, which gave no growth of bacteria. From the left ureter, the bacillus coli communis was obtained in pure culture. In two hours 10 c.c. of urine was discharged from the right kidney, and from the left 7 c.c.; in twenty-four hours, 200 c.c.

The patient had high fever and chills, with a diminished quantity of urine, and the uterus was emptied by vaginal section. After this, the patient improved and made a good recovery.

Weibel¹ contributes an interesting study upon the *antibodies in the maternal and fetal blood in cases of the pyelitis of pregnancy*, and on the clinical factors which indicate the etiology of the disease. He believes that the infection in pyelitis during pregnancy arises through two channels—the ascending from the bladder and the lymph channels. In the ascending variety of the disease are found those bacteria which are not met with in the intestine, such as staphylococci and streptococci. In the greater portion of infection occurring through the lymph the bacillus coli communis is the infecting agent. These germs make their way from the cecum and colon through the posterior wall of the bowel, and often also from the duodenum, without necessarily piercing the serous covering of the intestine. They pass readily to the lymph vessels in the kidneys and also into the ureters.

The pressure of the pregnant uterus upon adjacent organs, causing constipation and distention of the bowel with gas, so commonly observed in pregnancy, and the dilatation and paresis of the pelvis of the kidney and ureters, are favorable for the passage of the colon bacilli from the intestine; and the dilatation and paresis of the ureters and pelvis of the kidney assist in the infection of the urinary tract. The bacilli in the bowel act as saprophytes. When they are brought in contact with the urine, they become pathogenic; while in the bowel, they produce no antibodies; while in the urine, they form spores.

In many cases pyelitis is present before pregnancy supervenes. Gestation usually causes the process to become acute.

The prognosis has often been stated as unfavorable for both mother and child. In Weibel's 26 cases, 18 of the children were at full term and born living; 5 patients had premature labor; 1 had eclampsia and lost her child; and 1 patient with recurrent pyelitis had abortion in the fourth month.

The tendency of this process was to cause premature labor. None

¹ Archiv f. Gynäkologie, 1913, Band xcix, Heft 2, and Band c, Heft 2.

of the mothers died, and Weibel believes that pregnancy should not be interrupted, and that irrigation of the pelvis of the kidney through the ureter is the best form of treatment.

Jaschke¹ has studied the *prognostic importance of diseases of the kidney during pregnancy* in patients who have heart lesions. He believes that the danger consists in treating these cases by waiting too long. He believes that pregnancy should be interrupted, and that the mother should be given every opportunity for recovery.

Baisch² has studied the interesting question of *the ultimate condition of pregnant patients who suffered from disease of the kidneys and heart*. He examined the records of 205 cases of heart lesions complicating pregnancy, and 250 cases of infections of the kidneys. When the kidney of pregnancy alone is present, it occasions complications in pregnancy and labor. Well-pronounced nephritis in 226 cases had a mortality of 1.7 per cent., and in 57 per cent. of the cases eclampsia occurred; among these eclamptic patients one-fourth died.

In those who had nephritis without eclampsia, one patient, who had also a lesion of the heart without compensation, perished. In 40 per cent. of nephritic cases, not of the graver type, pregnancy went to its normal end, and 21 per cent. of the children were stillborn. In 140 nephritic patients who were examined during the following year, there were 9 who died; and among 60 eclamptics, 6 had died within the year, or 10 per cent.; 10 per cent. remained permanently as invalids; 13 patients had typical Bright's disease, among whom 4 died in hospital, and 2 during the year after leaving the hospital.

It seems a reasonable inference that such patients should not become pregnant, and that pregnancy, if present, should be interrupted. When nephritis complicates pregnancy, one can usually wait until the child is viable before interruption.

In 200 pregnant patients having valvular lesions of the heart, one-half of them had disturbances in compensation during pregnancy, and one-fourth had serious disturbances; 5 of these patients died during labor, and 3 more during the next year. Of these who were examined after recovery from labor, 50 per cent. were healthy, 45 were not in good health, and 5 per cent. had perished; one-third of the children were not carried to full term; one-third of the children were prematurely born; 9 of the mothers had myocarditis, of whom 5 died during labor and 2 within the next year. In 40 per cent. of labors occurring in patients with disease of the heart, there was hemorrhage following uterine relaxation.

The treatment of the mild and average cases should be conservative, with attention paid to the condition of the heart muscle. In severe cases, especially when myocarditis complicates nephritis, pregnancy should be interrupted.

¹ Archiv f. Gynakologie, 1913, Band ci, Heft 2.

² Zentralblatt f. Gynakologie, No. 22, 1913.

Jaschke¹ believes that all conditions of the kidneys which cause prolonged tension, bring about disease of the heart muscle; while uncomplicated cases of valvular disease do not give an unfavorable prognosis in pregnancy, the occurrence of a nephritic lesion greatly increases the risk. The occurrence of heart and kidney lesions in pregnant patients indicates the prompt termination of gestation.

Kolde² has studied *the suprarenal capsules* to determine their condition during pregnancy and after castration. He finds that between the suprarenals and the reproductive organs there is some relationship, partly from histological formation, which causes diminished function of the ovaries, as in pregnancy, or when ovarian action entirely ceases, as after castration. These conditions accompany, or are caused by, changes in the suprarenal capsules. The changes in the suprarenals during pregnancy are most plainly seen in guinea-pigs, while the alterations following castration are plainly observed in various other animals. In the human subject, changes in the suprarenals can be detected in pregnant patients.

Appendicitis Complicating Pregnancy. Rosenstein³ considers appendicitis a serious complication of gestation. Pregnancy is interrupted in about 50 per cent. of cases, always to the detriment of the mother.

He reports the case of a patient, aged twenty-three years, married six months, who complained during pregnancy of pain in the abdomen, with nausea and vomiting especially severe in the morning. She was taken suddenly while walking upon the street with severe pain in the abdomen accompanied by hemorrhage from the vagina. In the evening, the pain and hemorrhage increased, and the uterus was tender upon pressure. The cervix was closed, the pulse and temperature normal.

On the night following, the pain increased and was followed by vomiting. Under the influence of opium, the pulse and temperature were normal during the next day, but at evening there was again severe pain in the abdomen, hemorrhage from the vagina, and vomiting. Great abdominal distention developed, with pain upon motion.

The cervix was tightly closed, the uterus anteverted and well contracted.

Upon admission to the hospital, tenderness was elicited by pressure over the transverse colon and the descending colon at the ileocecal region.

Upon section, the adnexæ were found normal, but there was in the pelvis a bloody transudate which could be wiped away by gauze. The appendix was removed and its external surface found to contain several ecchymoses.

Upon microscopic examination, acute appendicitis was present and

¹ Zentralblatt f. Gynäkologie, No. 22, 1913.

² Archiv f. Gynäkologie, 1913, Band xcix, Heft 2.

Monatsschrift f. Geburtshilfe und Gynäkologie, 1911, Band xxxix, Heft 1.

an area of softening in the appendix, which would readily permit the passage of infectious material.

Burnett¹ describes an interesting case of bacterial infection of the fetal membranes in a primigravida, aged twenty-eight years, who had an abortion in the twenty-third week. The symptoms were, discharge of watery fluid occurring at intervals. When abortion occurred there was no liquor amnii, and the placenta was discharged spontaneously.

When the membranes were examined, a thickened yellow patch as large as the palm of the hand, was situated on the membranes opposite the placenta. The puerperal period was complicated by appendicitis, and four weeks later the appendix was removed and found to contain two drams of pus.

Upon examining a thickened patch of fetal membrane it was found that the thickening affected chiefly the chorion, which showed infiltration with leukocytes and areas of necrosis. There was evidence of extensive bacterial invasion.

In the *Journal of the American Medical Association*, November 8, 1913, Outerbridge reports the case of a patient, delivered of a full-term living child, who had excessive pain during labor and abdominal tenderness. Ten hours after, the abdomen was enormously distended, and the patient had stercoraceous vomiting. Upon section, free pus was found in the abdomen, and acute appendicitis. The patient died the next morning.

Upon examination, the usual evidences of appendicitis were found, with decidual-like cells in addition, being practically the effort to form a deciduous membrane.

Paddock² reviews the recent literature on the subject and urges the propriety and necessity of early operation.

In addition to his review of the subject, he cites his own experience in favor of early operation.

Futh³ draws attention to the fact that during pregnancy the cecum is pushed down to a much lower level than in the non-pregnant patient. It is sometimes found as low as the anterior superior spine of the ilium. This fact has considerable to do with the unfavorable prognosis and danger in appendicitis complicating pregnancy.

Is Albuminuria Likely to Recur in Successive Pregnancies? Slemmons⁴ concludes at present that the study of the albumin is a good clinical basis for determining the nature and virulence of the toxemic process. He regards the blood-pressure during convalescence as also of value.

Taking this as a basis, his clinical studies lead him to believe that auto-intoxication does not recur in approximately 80 per cent. of cases.

¹ British Medical Journal, May 24, 1913.

² American Journal of Obstetrics, September, 1913.

³ Archiv f. Gynäkologie, 1913, Band ci, Heft 2.

⁴ American Journal of Obstetrics, May, 1913.

The Wassermann Reaction in Pregnancy. Saratenau and Velican¹ conclude that the Wassermann reaction is of definite value in diagnosing syphilis in pregnancy. It is not infallible, but a positive result shows the presence of syphilis, although no special clinical manifestations can be found. A negative result does not invariably prove that syphilis may not be present.

When in general there is no indication, or but unreliable signs of syphilis, the result is negative. The Wassermann reaction proves that stillbirth and maceration of the fetus have occurred through syphilitic infection. The number of births, pregnancies and labors characterized by syphilitic infection causes the intensity of the reaction in general to become less, although it does not make the reaction absolutely negative.

The Glands of Internal Secretion in the Genesis of Fibroma Molluscum of Pregnancy. Brickner² draws attention to the occurrence of this condition of the skin, due to the cessation or inhibition of ovarian function and increase in the activity of the pituitary and adrenalin glands. It occurs after the fifth month, upon the neck and between and underneath the breasts in the form of small sessile, and more frequently pedunculated growths. These vary in size from a pinhead to half a split pea. They are always multiple, and never grouped according to any specific arrangement. There may be from ten to forty of them. They are usually first yellow, then becoming a yellowish or dark brown. Occasionally some of the growths have no pigment, and the pedicles always remain the color of the normal skin.

Microscopic examination shows hypertrophy of the papillary layer of the chorion, the general appearance being that of a soft fibroma moderately rich in connective cells. No muscle or nerve fibers are seen.

The condition usually appears between the fourth and sixth month, increasing slowly in number until full term. They usually disappear within a few weeks to a few months after delivery. They occasion no symptoms.

He also calls attention to an unusual condition of pigmentation in the nails in a primigravida.

The Psychoses of Pregnancy and Parturition, and the Indications for the Interruption of Pregnancy. Lienau³ found, in 39 cases of mental disease complicating pregnancy and parturition, that 16 recovered; 9 recovered with some mental blemish; 3 considerably improved after the birth of the child; 6 grew much worse; 3 died; and 2 remained without substantial change.

Among the 16 that recovered were 4 that had acute mania; and 12 in which the mental disturbance was melancholic. Among the 23 that

¹ Monatschrift f. Geburtshülfe und Gynäkologie, 1913, Band xxxvii, Heft 1.

² Surgery, Gynecology, and Obstetrics, October, 1913.

³ Zentralblatt f. Gynäkologie, No. 52, 1913.

did not make a complete recovery, 21, or 91.2 per cent., had suffered from severe intellectual disturbance.

The question naturally arises, under what circumstances may the interruption of pregnancy benefit a case of mental disease? When the patient had mental disease before pregnancy, and it recurred or became worse during pregnancy, should the mental condition threaten the life of the patient, pregnancy should be interrupted. If this were not the case, the patient should be treated in an asylum. When a patient becomes mentally diseased for the first time during pregnancy, pregnancy should not be disturbed unless the patient's life was threatened. Abortion is not justifiable in a patient who has already had an attack of mental disease. If a patient during her first pregnancy and puerperal period had mental disease, and was again in the pregnant condition, it would be important to have an accurate diagnosis of the first mental disturbance, an accurate estimate of the patient's present mental condition, and also the family history.

When a patient, during child-bearing, has two attacks in succession of mental disease, the pregnancy should be interrupted as early as possible. Obviously, conception in patients who have, or have had, mental disease, should be prevented.

Eclampsia After Rupture of the Uterus and Total Extirpation. Zweifel¹ describes an extraordinary case of a woman, aged twenty-eight years, in her fourth pregnancy, who was seized with unconsciousness, albuminuria, and who came into labor. Two physicians had made attempts at delivery with high forceps and version.

Upon examination, the fundus was at the border of the ribs, the head on the left side, there was dulness over the lower part of the abdomen, and no heart sounds. The diagnosis of rupture of the uterus was made and confirmed at operation. The uterus was removed entirely with the left tube and ovary. Drainage was used through the vagina. The patient was given salt solution and stimulants, and three and a half hours after the operation had eclampsia, with three typical and severe convulsions. On the third day after the operation she aroused from her coma, remained in a condition of mental disturbance for some time, and finally recovered.

Pregnancy Complicated by the Retention of a Gauze Tampon in the Uterus. Kuntzsch² reports an extraordinary case of a patient who had a placental polyp which was removed under anesthesia, followed by sharp hemorrhage, which necessitated tamponing the uterus. The patient would not remain in the hospital, and on her return home removed the vaginal tampon herself, the uterine tampon remaining. She had symptoms of metritis and consulted various physicians, who failed to diagnosticate the condition. She menstruated once, six weeks later:

¹ *Zentralblatt f. Gynakologie*, No. 5, 1914.

² *Ibid.*, No. 5, 1914.

then pregnancy ensued, and the patient went to term. Labor came on spontaneously, and as the head was expelled from the uterus the intra-uterine tampon of gauze 5 meters long, was expelled. The patient made an uninterrupted recovery.

The Relation between Pregnancy, Menstruation, and the Corpus Luteum. Miller¹ concludes that between ovulation and menstruation there is a definite relationship, and that the rupture of the Graafian follicle precedes the hemorrhage and menstruation by, on the average, nine days. While the ovum is passing through the tube, the granular membrane of the follicle develops into the corpus luteum, whose epithelial nature is demonstrated by its mode of development and by the presence of colloid material within the lutein cells, and the evidence of direct transference. Fresh corpus luteum gives no reaction to the test for fat. When it begins to undergo degeneration, the fatty tests become positive. The corpus luteum of pregnancy gives no fat staining during the entire duration of pregnancy.

The corpus albicans is formed through the dissolution of the fatty degenerated lutein cells through the hyaline changes in the connective-tissue reticulum.

A histological differential diagnosis of the corpus luteum of pregnancy can be made by recognizing colloid bodies and calcium deposits with the negative reaction to the fat test.

The yellow body is a granular material developed at regular intervals with an internal secretion. It is in relation with the development of the endometrium to decidua, for which the presence of the ovum is not necessary; but this development makes possible the implantation of the ovum. It acts as a trophic centre for the uterus, causing congestion and turgescence of the uterus and preparing it for pregnancy. It prevents a new development of the ovum during its functional life.

The so-called lactation atrophy of the uterus is not a reflex tropho-neurosis, but is the result of failure in development of the body which forms lutein.

Hormone does not give evidence of the formation of antibodies, and so the recognition of the internal secretion of the corpus luteum by chemical tests fails to demonstrate its complement. Attempts to isolate the secretion of the yellow body by methods of staining have as yet given no definite result. The toxemias of pregnancy probably are caused through a lack of function in the corpus luteum. Menstruation is simply the result of uterine hyperemia and has no direct bearing upon conception. It is probable that the blood loss during menstruation is a nutritious fluid of the ovum which is discharged when the membrane prepared for the ovum is discharged. The most probable time of conception is about ten days before the beginning of a new period. It is

¹ Archiv f. Gynäkologie, 1914, Band ci, Heft 3.

thought that the ovum has not become implanted immediately after menstruation. The time of implantation should be reckoned from the first absent period, and this reckoning will reduce the usual duration of pregnancy nineteen days.

The Treatment of Chorio-epithelioma Complicating Pregnancy. Proust and Bender¹ state that the prophylaxis of chorio-epithelioma consists in avoiding the retention of placental material or the remains of a blighted ovum, and the examination of material obtained by curetting to make as early a diagnosis of malignant growth as possible. Where it is not thought best to attempt a radical cure, something can be done by arresting hemorrhage and draining the uterus by packing, which will compress the growing tumor.

The radical treatment of the condition is hysterectomy—vaginal or abdominal. The majority of operators preserve the ovaries unless they are cystic. If hysterectomy can be practised before metastases have developed, the results are comparatively good. In 181 cases reported between 1903 and 1912, there were 126 recoveries, and 17 operative deaths. Recovery follows most frequently after a blighted ovum in 68.5 per cent.; in 58.8 per cent. after normal labor, and in 33.3 per cent. after tubal pregnancy.

It is sometimes difficult to recognize tissue which marks a return, and the most dangerous metastases are those which occur in the viscera. The extension of the growth to the tissues of the vagina does not contraindicate operation, and, as the growth spreads through the bloodvessels, the plexus of veins surrounding the growth should be thoroughly extirpated. It is rarely possible to interfere when the growth attacks the large viscera of the body. Should infection develop, or intraperitoneal hemorrhage occur, an attempt should be made to deal with the condition by operation at once.

In performing hysterectomy, the abdominal method is more satisfactory than the vaginal method, as it allows a more thorough examination and procedure. It does not seem to be of special advantage to dissect out the ureters or to try to isolate the lymphatic glands. There is no advantage in removing the ovaries if they are normal.

The Treatment of Ovarian Tumors Complicating Pregnancy and Labor. Peuch and Vanverts² believe that the removal of ovarian tumors during pregnancy is indicated so soon as a positive diagnosis can be made. Should labor develop, small tumors in the pelvis may be pushed above the pelvic brim to permit the descent of the child. The extraction of the fetus by forceps or version, in the presence of a pelvic ovarian tumor, is dangerous, and if violence is used, the forceps gives a mortality of 47 per cent., and version 77 per cent. Embryotomy is rarely more successful. Symphysiotomy, puncture of the cyst, and vaginal incision

¹ *Archiv. men. l'Obstétrique*, April, 1913.

² *Ibid.*

of the cyst, are contra-indicated, and vaginal ovariectomy is rarely efficient.

In considering abdominal ovariectomy, in many cases it may be well to perform delivery through the vagina, and later to remove the tumor. Abdominal ovariectomy is indicated if signs of infection develop, if the tumor is wedged into the pelvis, and if the tumor is so situated as to interfere with the circulation of the uterus and the life of the fetus. Many operators prefer to combine ovariectomy and Cesarean section. The latter should first be performed in the interests of the child, and should the uterus fail to contract, and hemorrhage occur, hysterectomy should be practised.

In 48 cases in which ovariectomy and Cesarean section were performed, the maternal mortality was 7.5 per cent., the fetal mortality 19.5 per cent.

Pregnancy, Labor, and the Puerperal Period Complicated by Ileus. Ludwig¹ calls attention to the difficulties in diagnosis in some of these cases.

The history, if it can be accurately obtained, is of importance, and the physician should try to get positive information concerning previous inflammation of the tubes, ovaries, or tissues about the uterus. Former attacks of appendicitis and peritonitis should be sought for in the history. All abdominal symptoms previously observed by the patient must be considered.

In making a diagnosis, the general appearance of the patient, symptoms of collapse, distention, constipation, and vomiting, are all characteristic. In pregnancy, the diagnosis of beginning ileus is especially difficult, as the symptoms may be less clearly pronounced than in the non-pregnant.

In one case observed by the writer, in which gangrene of the bowel developed, the symptoms were very obscure and not well defined. Ileus may be confused with peritonitis, appendicitis, the pain of beginning labor, after-pains, rupture of the uterus, and ectopic gestation.

The prognosis is a grave one since, in 89 cases, 49 perished and 40 recovered—a mortality of 55 per cent.

When ileus complicates pregnancy, it usually causes labor to begin, followed by the expulsion of a dead fetus. The death of the child probably results from a toxin passing through the wall of the bowel into the circulation, and thus being carried in the maternal blood to the fetus. Very few cases are on record in which pregnancy was not interrupted, but went to term with the birth of a living child. At the end of pregnancy, ileus is an especially fatal complication for the child. The patient's one chance in this condition lies in operation at the earliest possible moment. Every moment lost by delay tells greatly against both mother and child.

¹ Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxv, Heft 2.

The reports of successful treatment by atropin, eserine, physostigmin, and other drugs, are very uncertain. Many of these patients were finally operated upon with a successful result. So soon as the diagnosis is made, operation must be done. If ileus occurs in early pregnancy, the effort must be made to prevent abortion. At the end of pregnancy, if dilatation has not occurred, the fetus should be delivered by abdominal section. When the condition of the abdominal contents threatens infection, the abdominal wound should be closed, and the fetus be delivered by vaginal Cesarean section. Where the cervix is dilated, if the fetus be first delivered, there is danger that the gangrenous bowel will be rubbed by the manipulation necessary for delivery. Under these circumstances, it is best to deal first with the ileus and then proceed to deliver the child.

The Diagnosis of Syphilis by the Examination of the Blood from the Placental Site and Umbilical Vein. Krukenberg¹ finds that the serum from the blood taken from the placental site is alone not to be used in the diagnosis of syphilis, because it gives a positive reaction in 30 per cent. of healthy patients. In pathological cases, the percentage rises to 36.5, and, in cases of prolonged labor with strong uterine contractions, to 46 per cent. In eclampsia and abnormal delivery of the placenta without syphilis, it rises to 55.5 per cent.

Necrosis in the mother, fever, and the loss of blood during the delivery of the placenta, increase the number of positive reactions. If this reaction is to be considered reliable, it must be confirmed by serum taken from blood obtained from a vein in the arm.

A positive reaction to the Wassermann test by blood from the placental site points to the presence of albuminoid lipoid bodies from the placenta, a result which does not always agree with the Wassermann reaction applied to blood obtained at the time of the delivery of the placenta. Blood taken from the umbilical vein in healthy infants born of healthy mothers, gives a negative reaction to the Wassermann test, if syphilis be absent. If syphilis be present, it gives a positive reaction. Eclampsia, premature birth, necrosis, fever, long-continued labor, bleeding, and other abnormalities, including asphyxia, and death of the fetus, do not produce a positive reaction. A negative reaction in blood from the umbilical vein does not exclude hereditary syphilis in the infant; when the mother, although apparently healthy, gives a positive reaction, and the syphilis is apparently latent, or where both parents evidently have syphilis.

In these cases a control serum test of the child should be made at varying intervals. A negative result of the Wassermann reaction, and blood from the umbilical vein of a healthy newborn child, remains negative in 95 per cent. of cases, although the material from the placenta

¹ *Zeitschrift f. Geburtshilfe und Gynäkologie*, 1913, Band lxxiv, Heft 2 and 3.

may be added to the blood. In 5 per cent., a positive reaction occurs. If amniotic liquid be added, or a stump of umbilical cord be rubbed by the fresh blood-clot, the reaction is not changed. The examination of blood from the umbilical vein is one of our best methods of diagnosing hereditary syphilis in the newborn.

Pregnancy in Art. Stratz¹ draws attention to the representation of pregnancy in statues and paintings. He finds that the representation of the nude pregnant woman obtains in pictures and statues among primitive people and among the Japanese, in whose art the body is usually represented in its natural condition. In two of Rembrandt's pictures, pregnancy of four or five months is evidently present in one, and in another at seven months. In some of the Italian paintings representing Venus, pregnancy is also evidently present, but has not been recognized by the artist. In many sacred pictures the idea of pregnancy is conveyed, not by the exhibition of the unclothed body, but by draping the figure in the costume commonly worn by pregnant women of that time.

Pregnancy Complicated by Fibroid Tumors. Lynch² reviews the literature of the subject, and believes that abortion should be declined in these cases, as it merely interrupts pregnancy without removing the growth or diminishing the danger of complications in the placental period. Myomectomy has a restricted field, its maternal mortality ranging from 4 to 9 per cent., its fetal mortality from 23 to 29 per cent.

Supravaginal hysterectomy is the operation of choice, but is attended with considerable risk from thrombosis and embolism. Its maternal mortality is recorded as varying from 3 to 13 per cent.

At full term, the treatment naturally varies with the size and location of the tumor. Cervical growths are present in only 3.2 per cent., and hence interference with the action of labor from the tumor is comparatively rare. The danger in these cases is not so much from the blocking of the birth canal as from infection following the bruising and lacerating of the tumor. The longer the patient is in labor, and the greater the interference, the higher the mortality rate from infection. Early Cesarean section in threatening cases will usually give the best results, and the Porro operation is the safest.

During the puerperal period, infection may develop, and operation may then be necessary. Early interference is advisable in cases presenting multiple growths, and in cases where infection develops during the puerperal period.

Care of the Nipples during Pregnancy. Krüger³ has made observations to determine whether the prophylactic care of the nipples reduces the frequency of mastitis. He finds that, when the nipples had no treatment

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

² American Journal of Obstetrics, September, 1913.

³ Zentralblatt f. Gynäkologie, No. 27, 1913.

whatever during pregnancy, 60 per cent. of them remained sound and uninfected during lactation; with prophylactic treatment, 54 per cent. He believes that so-called prophylactic treatment is not only useless, but may be harmful.

In discussion, Küstner believed that alcohol applied to the nipples during pregnancy was harmful, and that he had obtained the best results by cleansing the nipples with soap and water, which removed excessive secretion.

In discussion, others condemned the use of alcohol and other hardening agents in preparing the nipples for nursing.

Tetany Complicating Pregnancy. Kehrer¹ calls attention to the researches which show that a predisposing cause for tetanus during pregnancy is the lack of calcium in the blood. In prophylaxis and treatment, the administration of calcium preparations usually brings the cases to a prompt termination, the calcium chlorate and lactate being especially useful. Where no result follows the administration of calcium preparations, the effort may be made to use with it intramuscular or subcutaneous injections.

The fact that cows' milk contains a considerable percentage of calcium and that certain vegetables contain calcium, indicate their use in the treatment of the condition. Meat is contra-indicated, and chemical substances which are antagonistic to calcium.

The use of a serum for immunizing is indicated, and some good results have been obtained by using preparations of parathyroid.

The treatment by transplantation of thyroid tissue is yet in the experimental stage, and has not given definite results.

These cases require prolonged rest, the use of narcotics is necessary, and, in some cases, curare has given good results. Chloroform and preparations of ergot must not be employed. The use of warmth in baths or packs has given good results in some cases.

In a case of osteomalacia complicated by tetany, Cesarean section was performed in the seventh month of pregnancy without improving the condition of the patient. The interruption of pregnancy is not indicated in these cases.

To summarize the treatment, the free use of calcium preparations, a plentiful diet with food containing calcium, parathyroid substances, and immunizing serum, give the best results.

Cholera Complicating Pregnancy. Mitro² reports 1 case of pregnancy at term complicated by cholera, 4 between the seventh and ninth months, and 9 before the end of the sixth month.

He places the mortality of cholera among pregnant women at 29 per cent., while the general mortality of the same epidemic was 27 per cent.

¹ Archiv f. Gynäkologie, 1913, Band xcix, Heft 2.

² Annali di Ostetricia, No. 9, 1913.

Other observers gave a mortality rate ranging from 18 to 90 per cent. In the majority of cases, the fetus dies.

The treatment is that used in cholera epidemics, and no alteration is made in view of the pregnant condition.

The Influence of Tobacco upon Pregnant Women. Aymerich¹ has studied the influence of tobacco upon women who during pregnancy work in tobacco factories, or in some cases use tobacco to excess. The absorption of tobacco in a small quantity produces little, or no, effect upon the mother during pregnancy, nor does it bring about labor. The fetus is born living and in good condition, but when intoxication is severe, the fetus is stillborn and the mother's puerperal period is interfered with. Nicotine lessens the vigor of uterine contractions and interferes with the nutrition of the embryo.

The Influence of Atmocausis upon Subsequent Pregnancy. Baumgart and Beneke² report an interesting case of a woman, aged thirty-two years, brought into hospital with transverse position of the fetus, and with a history that she had been in labor several days with strong pains. Four years previously she had suffered from metrorrhagia, had been curetted, and suprarenalin and atmocausis given as treatment. The menstrual discharge ceased. After this, the patient had a catarrhal discharge and pain, for which she received local treatment.

The patient could give no accurate history concerning her pregnancy, as menstruation had been absent for four years.

Upon examination, the cervix was directly behind the symphysis, the cervix admitted one finger, the internal os was closed, and firm, hard scar tissue was present. One could not make out the fetal heart sounds nor palpate the fetus. The patient complained of pain every four or five minutes, and the abdominal tumor, which reached three finger-breadths below the tip of the sternum, became hard.

After some days in the hospital, under observation, the patient's pulse and temperature rose, and abdominal section was performed. The uterus consisted of a compact, firm tumor resembling in color a fibroid uterus, but not pregnant. With the uterus turned out of the abdomen it was impossible by touch to recognize fetal parts. The abdomen was closed, the uterus amputated at the cervix, and the cervical stump stitched at the lower end of the abdominal wound. The stump was drained by a strand of iodoform gauze passed through the vagina. The patient made a good recovery.

The usual signs and symptoms of pregnancy were absent, and the patient had had pain at intervals for two weeks without the slightest dilatation of the cervix at the internal os. The scar tissue which developed after the atmocausis had evidently made the cervix incapable of dilatation.

¹ *Annali di Ostetricia*, No. 9, 1913.

² *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1913, Band xxxviii, Heft 6.

In reviewing the history of cases treated by atmocautis where pregnancy afterward occurred, there was great difficulty in loosening and removing the placenta in 2 patients; the cervix dilated with great difficulty in 2; and scar tissue was excessive in 2.

Examination of the specimen showed the uterus to be distended, its wall thin at the fundus, but 2 mm. in thickness, and in the middle of the body of the uterus 5 mm. The serous covering of the uterus was smooth and very thick—much thicker than that of the normal pregnant uterus. The ovarian ligaments and the tubes were attached relatively low. The right ovary was small and somewhat shrivelled, the left remained in the body of the patient. The cervix had been converted into practically scar tissue. A portion of the back of the fetus upon the left side seemed to have adhered to the uterine tissue above the internal os. The umbilical cord was 30 cm. long and sprang from the middle of the posterior wall of the uterus at about the level of both the ovaries. The placenta was spread out as a very thin surface upon the inner wall of the uterus, and was firmly adherent to the uterine wall. One could not detect a marginal sinus, or a sharp division between the placenta and decidua. The amnion was normal, and the vessels in the placenta showed no unusual condition. The fetus was 50 cm. long, well developed, and much compressed and bent upon itself.

Microscopic examination of the uterine wall showed very long and thin muscular fibers, and there was an entire absence of decidua in the region of the placenta. The villi of the placenta seemed to be directly upon the muscle of the uterus.

It is interesting to observe that the mucous membrane of the uterus had not been regenerated after the atmocautis, but that, practically, scar tissue had replaced the usual lining membrane.

Pregnancy Complicated by Disease of the Heart. Webster¹ states that acute cardiac disease is rare in pregnancy and must be regarded as very serious. In the early months rest and medical treatment are indicated, and after a few weeks of improvement the uterus must be emptied. In the later months of pregnancy, when acute valvular lesions or myocardiac degeneration occurs, it seems best to interrupt pregnancy, with the hope that the cardiac disease may be arrested. When women who have heart disease for some time become pregnant, the pregnancy should be terminated. The most serious cases are those in which the myocardium is degenerated, with a tendency to dilatation of the heart, or in which, after valvular disease, compensation is not established. Mitral lesions, which are more frequent than aortic, and a mitral stenosis with regurgitation, are especially dangerous. When cardiac failure develops during pregnancy there is pulmonary congestion and edema, weakness, and dilatation of the right side of the heart.

¹ Surgery, Gynecology, and Obstetrics, September, 1913.

The fetus may be in danger from imperfect oxygenation of the maternal blood and from destruction of the placental tissue by hemorrhage. Emptying of the uterus may take place. The death of the mother may occur independently of the emptying of the uterus.

If a patient with cardiac disease becomes pregnant and desires to run the risk of continuing the pregnancy, she must be put under strict prophylactic care. Medicines should be used only when absolutely necessary, digitalis or strophanthus being reserved, if possible, for the last month. If there is a tendency to the termination of pregnancy, this should be assisted. If signs of cardiac failure develop, the patient must be kept quietly in bed, and efforts made to improve the condition of the heart. Should such improvement occur the pregnancy must be terminated. If no such improvement occurs, and marked signs of cardiac failure develops, the patient's condition is desperate, independently of the emptying of the uterus.

The Skin Striations. Taussig¹ finds that out of 60 primiparae, 47 had striations upon the skin. These usually appear about the sixth or seventh month, and are decidedly more pronounced in girls under twenty years of age, and more frequent than in older women. Obesity and rapid increase in weight during pregnancy predispose to the formation of striae, especially about the breast and thighs. A lack of abdominal support during pregnancy, as in those who wear no corsets, favors the formation of striae. The tense and inelastic skin in which such striae are found seems to favor subsequent relaxation, or this occurs in these cases previous to labor. There is no relation between these striae and lacerations of the perineum. The persistent employment of proper massage will, in most cases, prevent their formation.

Ectopic Gestation. PREGNANCY IN THE RUDIMENTARY CORNU OF A UTERUS UNICORNIS. Quain² describes the case of a patient who, at about the usual term, had severe intermittent pains in the lower abdomen, and expelled from the vagina a small mass of tissue and blood. After this fetal movements ceased. A few days later this returned, and since then there had been abdominal tenderness with gradual decrease in the size of the abdomen, and the development of a hard tumor near the umbilicus. The breasts, which had been large and distended with milk, decreased in size.

Upon examination, the abdominal tumor was the size and shape of the pregnant uterus in the seventh month, but tender and exceedingly hard to palpate. The vaginal mucous membrane was pale, the cervix hard, closed, and of normal size.

A normal-sized uterus was located below and to the left of the tumor, but attached to it by a thick, firm band. There were no fetal heart sounds or uterine bruit. There was leukocytosis of 10,000.

¹ Surgery, Gynecology, and Obstetrics, September, 1913.

² Ibid., October, 1913.

Upon opening the abdomen, the omentum was adherent to the anterior wall of the tumor over two small necrotic areas, from which dark grumous fluid escaped. The right tube was stretched across the upper part of the tumor, and the right ovary was attached to the right side of the pelvic floor by a very broad and vascular pedicle.

The tumor, aside from its hardness, resembled a pregnant uterus, and the uterus itself, pressed into the left portion of the cul-de-sac, was apparently a normal and non-pregnant uterus. The right tube and ovary were in relation with the tumor, the left with the uterus. The pedicle was clamped, and the tumor with the tube and ovary, removed. The patient recovered without complications.

Upon incising the tumor a dead, partly macerated and compressed fetus escaped. The placenta was thin and necrotic, with perforations where the fetal parts had pressed against it. The cyst could be traced to a rudimentary cornu of a uterus unicornis.

The difficulties occasioned in diagnosis by the presence of a dead fetus in the abdomen are illustrated by a case recently operated upon by the reviewer. The patient, a healthy young primipara, had the signs and symptoms of normal pregnancy, and when near her expected time she was taken with eclampsia. Under medical treatment, she recovered without the interruption of pregnancy. After the eclampsia, fetal movements and heart sounds could not be appreciated, and the abdomen gradually grew smaller. Finally, a hard, firm tumor resembling a fibroid uterus remained. The patient's general health improved, and she was thought to have a uterine tumor. When, seen several months after, there was no sign nor symptom of pregnancy, the cervix was a small, hard, undilated body, and the uterus could not be separated, on bimanual examination, from the tumor.

The diagnosis of abdominal pregnancy with a dead fetus, or uterine tumor, was made.

Upon opening the abdomen, a full-term, dead fetus was contained in a sac among the intestines, the placenta being attached to the posterior surface of the right broad ligament. The fetus was removed, the cord cut short, and the membranes stitched to the lower end of the abdominal incision. The sac was packed with 10 per cent. iodoform gauze, and the patient gradually made an uninterrupted recovery.

It is interesting to observe that the abdominal fetus shared in the mother's eclampsia, and perished as a result.

INFLAMMATION AS THE DEVELOPING CAUSE OF ECTOPIC GESTATION. Meyer¹ has studied the relation between previous inflammation and the development of decidua in ectopic pregnancy. He finds that where decidual tissue is found upon the anterior uterine wall, intestine and omentum, there are always evidences of a preëxisting condition of

¹ Zeitschrift f. Geburtshilfe und Gynakologie, 1913, Band lxxiv, Heft 1.

irritation resembling inflammation. The process must be called that of irritation more than of inflammation as the result of infection. It is thought that ectopic decidua forms first after the third month.

BILATERAL AND MULTIPLE ECTOPIC PREGNANCY. McDonald and Kreager¹ have tabulated cases of bilateral ectopic pregnancy which had been positively demonstrated and those which seem probable, but have not been proven. They report two cases of bilateral or tubal ectopic pregnancy. The first case was a woman in her third gestation, who had repeated hemorrhages which culminated in severe pain and shock. Upon examination, there was abdominal tenderness and distention, with an irregular mass over the symphysis and a boggy mass filling the uterus and pelvis.

At operation, there was much partly coagulated and fluid blood not encapsulated. Both lateral masses were removed, the tubes found to be greatly enlarged, containing masses resembling chorionic villi, and connected with each tube, a fetus. One was more perfectly developed than the other, but there could be no doubt concerning both. After operation, the patient expelled from the uterus the remains of placental tissue and fetus.

In the second case, there was pain low in the abdomen on the left side, with normal menstruation, and tumor. Upon opening the abdomen, the left tube and ovary, with ectopic pregnancy, were bound down by adhesions, making a mass the size of a small orange. The right ovary was macerated and bound by adhesions in the pelvis. It was about the size of a hen's egg. Upon breaking up the pelvic adhesions, each tube was found the site of ectopic gestation. Microscopic examination revealed the presence of decidua.

ABDOMINAL PREGNANCY WITH A LIVING CHILD. Horsley² quotes from 104 collected cases, 49 maternal deaths. In but 5 of these cases did the child survive its birth twelve months.

The writer reports his own case, a negro, multipara, who passed through pregnancy without suspecting any unusual condition until apparent labor pains began. It was then found that the uterus was empty, although an abdominal tumor containing a child, was present.

The patient was brought to the Memorial Hospital, Richmond, Virginia, where she was operated upon. Upon opening the abdomen, the child was found largely to the left of the middle, lying among the intestines, and covered only by a thin membrane, which also surrounded the placenta. The child was delivered rapidly, a male, weighing six pounds, and normally formed. The placenta and sac had a distinct pedicle from the left broad ligament, which was ligated, and the placenta and membranes removed. The condition resembled closely an ovarian tumor, the child and placenta constituting the contents. A drainage

¹ Journal of the American Medical Association, June 7, 1913.

² Surgery, Gynecology, and Obstetrics, July, 1913.

tube was placed in the cul-de-sac through a stab-wound in the right flank. The patient rallied from the operation, and nine days afterward had pain in the right side, and fever and a mass developed in Douglas' cul-de-sac. Posterior vaginal section was made, followed by a free discharge of blood. A rubber tube was placed in the opening. Mother and child made a good recovery and were in good condition more than a year after the operation.

TWO CASES OF EXTRAMEMBRANOUS PREGNANCY. Brouha¹ reports the case of a multipara, who, when six months pregnant, lost considerable amniotic liquid which was very slightly tinged with blood.

Upon examination, the fundus of the uterus was undilated, low for the period of gestation, it was difficult to palpate the child, and the uterus was tightly packed upon it. With energetic uterine contractions, the child was rapidly delivered, premature, and lived an hour. The placenta was delivered two and a half hours after the birth of the child by expression. The patient had a slight rise of temperature, with foul lochia for a few days.

Upon examining the child, the lower limbs were strongly but irregularly flexed, and the hands were peculiarly bent upon the wrists.

Upon dissecting the body, there were abnormalities in the joints in the lower extremities, showing the result of pressure. It was evident that the child had developed outside the amniotic cavity, and that the premature escape of the amniotic liquid had exposed the fetus to practically fatal pressure.

The second case resembled the first pregnancy, terminating at about the same period, the child surviving but a short time. It showed the same abnormalities, which had evidently been caused by the premature rupture of the membranes and the escape of amniotic liquid.

SIMULTANEOUS PREGNANCY IN BOTH TUBES. Unterberger² reports the case of a multipara admitted to hospital after six weeks of amenorrhea, suffering from severe pain in the left, lower portion of the abdomen, which had suddenly developed, accompanied by severe shock. Eight days later a second attack occurred, the pain being more diffuse over the entire lower abdomen.

Upon examination, the patient was pale, with anemic heart murmur, but well nourished, and with normal temperature.

Upon vaginal examination, there was a tumor behind the uterus, but nothing else could be distinctly made out. Upon opening the abdomen, there was no free blood in the abdominal cavity, and the omentum was adherent to the pelvic tissue. There was an hematocele behind the uterus as large as a child's head, and this had developed in a left-sided tubal abortion. When this had been removed, it was found that the right Fallopian tube had been pregnant, had ruptured, and had formed

¹ Archiv. men. l'Obstétrique, September, 1913.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1913. Band xxxviii, Heft 3.

a smaller hematocele encircling the tube. The villi of the chorion could be made out in the ruptured portion of the tube. Both hematoceles were distinct and separate. The left ovary and tube were removed, the right ovary and uterus allowed to remain. The patient made a good recovery.

OVARIAN PREGNANCY WITH FULL-TIME FETUS. Grimsdale¹ reports the case of a multipara who was admitted to the hospital for an abdominal tumor, complaining of no pain. She was well nourished, slightly bluish in color about the face, and with normal heart action and pulse. The urine was normal.

A hard, freely movable, rounded swelling, could be felt in the abdomen reaching to the umbilicus. The tumor was not tender, but dull on percussion. There was no ascites.

By vaginal examination, the uterus was not enlarged, and was entirely separate from the tumor. A diagnosis of solid tumor of the ovary was made.

Upon opening the abdomen, the tumor was freely movable, with one small adhesion to the omentum, and was readily delivered through the abdominal wound. It was then seen to be identical with the left ovary. The left tube and mesosalpinx were normal, and the left round ligament was to the right of the tumor.

Upon examining the tumor after removal, its external surface was smooth, and the contour regular. It resembled exactly an ovarian solid tumor. Upon opening the tumor, it was found to contain a fetus and placenta.

It was curious that no history of amenorrhea, except that corresponding with the patient's uterine pregnancies, could be obtained. There was also no history of abdominal pain, suggesting a rupture of the sac, or hemorrhage, at any time.

PREGNANCY AT TERM IN THE ACCESSORY HORN OF A UTERUS BICORNIS. Hollaender² reports an interesting case of a primipara in whom the diagnosis of pregnancy at term, in one rudimentary horn with bicornate uterus, was made before operation. The uterus itself was proved to be empty upon dilating it and introducing a solid bougie.

At operation, the abdominal wall was very thin, the tumor adherent to the peritoneum, and extending two fingers above the umbilicus. It was possible to separate adhesions and deliver the tumor. The normal portion of the uterus was upon the left, the tumor upon the right, and to this was adherent a long appendix. There was an intermediate portion of the uterus joining the tumor and the normal portion. The appendix was first removed, then the tumor, and the right broad ligament and round ligament were severed, and the cut surfaces covered with peritoneum.

Upon examining the tumor after removal, it had much the form of a

¹ Journal of Obstetrics and Gynecology of the British Empire, February, 1913.

² Archiv. men. l'Obstétrique, April, 1913.

normal uterus, but its wall was very thin. The tube and ovaries seemed to be normal.

Upon section, the tumor contained brownish amniotic liquid somewhat decomposed, and a fetus 52 cm. long, normally developed, but macerated and very much compressed. The placenta was inserted in the tumor and was large and well developed. The cord was unusually thick, normal in length, and had a villimentous insertion. Microscopic examination showed that the fetal sac was composed of uterine muscle. The patient made an uninterrupted recovery, and, on leaving the hospital, the uterus was normal and anteфлекed; the left ovary and Fallopian tube were also in normal condition.

THE TREATMENT OF ECTOPIC GESTATION. Falk¹ would operate upon ectopic gestation when he could make out that the ectopic gestation had not aborted. Signs of hemorrhage should make operation imperative at once. Without this, when tubal abortion is diagnosticated, it should be carried on, if possible, until the seventh week before operation, as conditions are then most favorable. Should the patient have hemorrhage from the uterus and vagina, with signs that the tumor is increasing in size, operation should at once be undertaken. When in doubt, it is better to operate too early than too late.

In 81 operations, with 3 fatal cases, there were 35 in which the operation was of necessity. Among these were 2 of the 3 deaths—a mortality of 5.7 per cent. Among these 35, were 26 cases of ruptured tube, and 9 of tubal abortion.

He observed that the rise in temperature which one often sees after tubal abortion or ruptured tubal pregnancy was caused by the irritation of the peritoneum by the blood. This exposes the patient to danger, as the blood in the abdominal cavity may become infected.

The practical conclusion from this observation is that, whenever circumstances permit, the blood should be removed from the abdomen at the time of operation.

In discussion, Fidler reported in four years 108 cases of ectopic gestation operated upon as soon as possible after admission to the hospital, with no maternal deaths. He urges operation at the earliest possible moment.

In operating, he prefers the transverse incision, and, with the abdomen opened, makes the diagnosis, removes the infected tube, and does nothing. No effort was made to remove the blood from the abdomen, and he does not consider its presence dangerous.

Sigwart reported 73 cases in Bumm's clinic in two and a half years, of whom 20 had free bleeding into the abdominal cavity; 19 of these 20 patients recovered; one perished on the following day from anemia and shock. This fatal case had, in addition, an extensive peritonitis.

¹ Zeitschrift f. Geburtshilfe und Gynakologie, 1913, Band lxxiv, Heft 2 and 3.

Of 53 patients having encapsulated hemorrhage, 44 were treated by abdominal section, and 9 by vaginal section. One of the 44 died ten days after the operation from pulmonary embolus. The death rate in the 73 cases was 2 per cent. of 2.7 per cent.

The abdominal operation is preferred in this clinic.

LABOR.

The Treatment of Labor in Contracted Pelvis in the Clinic at Basle. Cuny¹ gives the results of his treatment in 1368 mothers with contracted pelvis. The maternal mortality was 0.6 or 0.4 of 1 per cent.

The causes of maternal death were, eclampsia, 1; pyonephritis, 1; carcinoma of the stomach and degeneration of the heart muscle, 1; hemorrhage from lacerated cervix, 1; peritonitis following rupture of the uterus, 1; peritonitis, the patient admitted infected and delivered by section, 1.

The only death which can be strictly ascribed to contracted pelvis was that following laceration of the cervix and hemorrhage.

The statistics have improved somewhat by using Ahlfeld's method of antiseptics combined with alcohol. Among these patients, 301 had fever—a mortality of 22 per cent. Of the 1389 children, 125 were still-born, or perished within a short time.

The most frequent cause of fetal death was asphyxia, and the mortality rate among the children, 8.9 per cent.

So far as possible, cases were treated by the induction of labor, which produced spontaneous birth in 88.7 per cent. He concludes, from his experience, that for practice in private houses the induction of labor, usually accomplished by the rupture of the membranes, is satisfactory. He believes that when these results are compared with those obtained by other methods of treatment in contracted pelvis, that for the mother, at least, they will prove quite as good.

Esch² has studied the influence of the flat pelvis upon the birth of the fetus in normal cranial presentation. He finds that the influence of flat pelvis in labor pertains equally to primiparæ and multiparæ. So long as the true conjugate remains as high as 9.25 cm. the conditions are favorable for multiparæ; but if the true conjugate is less than this, and still sufficient to permit the birth of a living, viable child, the conditions are more favorable for primiparæ. The lessened resistance of the soft parts in multiparæ with true conjugate as large as 9.25 cm. gives the child a better chance; while with moderately large true conjugate the conditions are more favorable for multiparæ; under 9.25 cm., the primipara has the better chance.

¹ Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

² Ibid.

Without considering the question of primiparity or multiparity, in 4467 vertex presentations with flat pelvis, 3647 children were born spontaneously, at least through the upper pelvis, and were delivered alive, making 87.5 per cent.

The Intra-uterine Application of the Forceps during Labor. Newwirth¹ has constructed a pair of forceps which he finds especially adapted for use within the uterus before the os is dilated. He would cautiously bring the head down in most of his cases. From six to ten pulls upon the forceps have been sufficient. The instrument which he employs is an old Viennese model, the blades being crossed well toward the head, and with Braun's lock. He uses the head under the grasp of the forceps as a dilator, and does not attempt delivery until the cervix is well dilated.

Rupture of the Membranes and Stricture of the Cervix. Bayer² considers rupture of the membranes as an obstetric operation of considerable importance. He reviews the various theories upon the subject, and finds that, after the rupture of the membranes, the effect of uterine contraction becomes more powerful, and that labor will have a shorter course, even though the apparent strength of uterine contractions does not increase. When the amniotic liquid in front of the head is lacking, and the membranes are upon the head, rupture of the membranes hastens delivery.

The Use of Forceps in Private Practice. Fleurent³ describes his use of the forceps in private houses. For disinfecting his instruments and his hands, he uses soap and water and an antiseptic solution, usually bichloride 1:1000. He cleanses the external genitals with lysol, 1 per cent. In obstetric operations, he rarely uses gloves.

His instruments are brought to the patient's house already sterilized, and he uses two models of the forceps—one Tarnier for axis traction, and a small and light instrument for delivery when the head is upon the pelvic floor.

In 283 cases of labor, he has had 71 forceps operations. Four times the forceps was tried, but was abandoned for craniotomy. Among these patients were 49 primiparae, from thirteen to twenty-eight years of age, and 22 multiparae. The percentage of primiparae was 69, and multiparae 31. There was no maternal death, and one case of pelvic thrombophlebitis, with chills and high fever. The patient finally recovered completely.

As regards lacerations, he had one total laceration of the pelvic floor and perineum caused by the slipping of the forceps in a primiparous patient. This was closed by suture and healed by first intention.

The less severe lacerations of the pelvic floor and perineum occurred in 55 per cent. Of these, all but 4 healed promptly after suture. In

¹ Zentralblatt f. Gynäkologie, No. 37, 1913.

² Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxiv, Heft 1. ³ Ibid.

hospital patients, 50 per cent. delivered by forceps had lacerations. He had among his private cases no laceration of the cervix which required suture or the use of the tampon. The cervix was incised in 2 cases, once in eclampsia, and again in beginning infection. He had 3 cases of atonic hemorrhage which yielded to injections of ergotin, hot douching and massage of the uterus. It was necessary to remove the placenta in a multipara after waiting several hours for its spontaneous delivery. The patient made a good recovery.

Anesthesia was employed in 27 forceps operations, and in 3 by the obstetrician himself until the patient was completely anesthetized, when it was entrusted to the midwife in attendance. Chloroform was used without bad results. In 3 cases, scopolamin and morphin was given, but was unsuccessful. Chloroform was finally used. One child was born dead, one was severely asphyxiated and could not be resuscitated, making a fetal mortality of 2.6 per cent. The remaining 69 children were all in good condition two weeks after birth.

Of the two fetal deaths, one was undoubtedly caused by the forceps. The mother's pelvis was contracted. The first labor had ended in craniotomy. In the second labor, the head became impacted in the pelvic brim, and delivery was effected by Tarnier's forceps, the child being deeply asphyxiated. It could not be revived.

The endeavor was first made to use scopolamin and morphin, but one hour after this was given the fetal heart sounds became bad and it was necessary to deliver the child under chloroform. There was no case of injury to the child, such as that which often produces paralysis of the facial nerve.

Of the 71 forceps operations, 4 were high applications, 14 the middle forceps, and 53 forceps at the outlet. Of the 4 applications called high forceps, in 3 the indication was exhaustion of the mother, and, in 1, the altered heart sounds in the child. Of the 53 applications made at the outlet, the head was transverse on the pelvic floor in 2, the occiput posterior in 2, the brow presented in 1, and the face in 1.

The writer calls attention to the fact that in private cases one is often unable to wait until the mother is actually in danger before using forceps. Oftentimes the anxiety of friends and relatives, and the patient's inability to bear pain, make the operation imperative. In his cases, the indications were, eclampsia in 1; delay in 4; fever and beginning infection in 3; dangerous pressure in 6; transverse position of the head with failing pains in 2; feeble heart sounds in 7; acute mental disturbance complicating labor in 1; failure of uterine contractions and exhaustion in the mother in 47.

Labor Complicated by Sudden Death. Good¹ reports the case of a primipara who was well during pregnancy except for slight digestive

¹ American Journal of Obstetrics, June, 1913.

disturbance in the early months. The urine was normal, and labor came on thirteen days after the expected time. After a practically normal labor, the patient expelled the child spontaneously, and the placenta was expressed soon after. There was some hemorrhage which was controlled by a hot douche; the pulse was 110.

It was noticeable that the uterus was well contracted, but very sensitive upon pressure. The pulse increased in frequency and grew weaker, the patient was restless, had a peculiar color, and was much benefited by twenty ounces of salt solution introduced into a vein. The patient died suddenly. An autopsy was forbidden.

The second patient, aged forty-two years, a multipara, had premature rupture of the membranes without uterine contractions. This was followed by a severe attack of nausea and vertigo. Three days after the rupture of the membranes indefinite and vague pains developed, and six days after the escape of the amniotic liquid the patient had hard pains, and gave birth to a rather small child. This was followed by prostration, vomiting, rapid and soft pulse, and sallow color. The uterus was sensitive upon pressure, and stimulation produced no permanent results. The patient died, retaining consciousness to the end.

Upon opening the abdomen, it was rigidly contracted, blanched, without rupture of the intestines, pale in color, and filled with saline fluid which had not been absorbed.

These cases were undoubtedly those of acute toxemia with vasomotor paresis. The nausea and vomiting, the character of the pulse, the sallow color, and the contracted condition of the uterus, established a basis for diagnosis.

Sudden Death with Air Embolism Complicating Labor. In the *Archiv f. Gynäkologie*, 1913, Band ci, Heft 2, Jlyn reports from von Ott's clinic, in St. Petersburg, 3 cases of sudden death—2 after labor and 1 after removal of a fibroid tumor, in which autopsy permitted a thorough study of the case.

His first case was that of a patient who had normal labor and puerperal period, and who was discharged from the hospital on the eighth day. She had scarcely left the door of the institution when she fell dead. An autopsy was performed on the day following. The left ventricle was contracted, empty, and the left auricle contained a quantity of fluid blood. The right ventricle was distended with fluid blood in which were abundant bubbles of air. Both lungs were not adherent to the pleuræ, smooth, and the lung tissue edematous. The left portion of the pulmonary artery contained a reddish-yellow thrombus. This extended downward to the vessels going into the lung.

Upon making section of the uterine wall, air-bubbles were found in the venous sinuses mixed with the blood. In the posterior wall of the inferior vena cava, at the bifurcation, there was a reddish-yellow thrombus adherent to the wall of the vessel, but not entirely closing its lumen.

Death had evidently been caused by air entering the uterine vessels, then passing as emboli to the right heart and pulmonary artery.

The second case was that of a patient who had a submucous fibroid removed by vaginal operation. The bed of the tumor was tamponed with iodoform gauze. The operation proceeded rapidly, without hemorrhage, and under chloroform narcosis.

As the patient was carried out of the operating room she became cyanotic, with cold extremities and cold sweat. The pulse at first was regular and full, but soon became much weaker in spite of stimulation. Death quickly followed.

At autopsy, twenty-four hours later, there was evidence of fatty degeneration in the heart and the muscle was elastic and reddish. The heart was contracted, the right full of fluid blood mingled with bubbles of air. The color of the blood was bright and arterial. Similar blood was found in the pulmonary artery. The heart valves were normal. The lung tissue was edematous, and on the left side of the neck of the uterus there was a laceration which had opened a vein whose circumference was 0.3 of 1 cm. On removing the uterus, blood mixed with air flowed from this vein. The body of the uterus was fibroid in character.

Here the cause of death had been the entrance of air into the vein at the torn cervix.

His third case was that of a primipara, aged seventeen years, delivered by forceps because of long labor, weak pains and rise of temperature. The uterus contracted poorly, and the patient had hot vaginal douches and ergotin hypodermically. Five and a half hours after labor the patient grew much worse, expelled a large clot, the pulse became very weak, and the patient partly collapsed. The uterus was distended with fluid blood. The uterus was tamponed with gauze, salt solution given, but the fluid blood continued to make its way through the tampon. Momburg's bandage was applied, but fifteen minutes after the removal of the bandage uterine hemorrhage returned, when the bandage was again applied and allowed to remain for an hour and a half longer. Stimulation was given and the uterine tampon renewed.

The patient was placed in the Trendelenburg posture, salt solution was given in the vein, gelatin injected, and artificial heat employed. Treatment was unavailing and the patient died.

At autopsy, twenty-six hours later, the body was very anemic, the heart normal in size, the right heart and pulmonary artery filled with bright blood mixed with bubbles. The veins in the wall of the uterus and in the broad ligaments were filled with coagulated blood. In a vein in the right arm where intravenous saline transfusion had been given, there was a small collection of air-bubbles in the fluid blood.

A diagnosis of death from air embolism was made.

In commenting upon these cases the writer very justly doubts the diagnosis of death from air embolism. In surgery, the most instructive

cases of this accident occur in operations about the neck, where air is heard to enter a large vein which may be accidentally or purposely severed. Cases have been observed, however, in which, in various manipulations, air has been injected into the vessels without serious result.

Jlyn experimented upon dogs by injecting air into the veins, being careful to regulate the quantity so that sufficient pressure was not produced to destroy life. This was done repeatedly and in increasing quantities. Immediately after the injection, the dogs seemed somewhat weak and stupid, as if under the influence of a narcotic. On the following day, the condition of the animal was apparently normal. Dogs were killed during the injection of air into the veins and at various periods up to six and a half hours, when it was found that air disappeared from the veins with great rapidity.

Pathological conditions were found in the lungs in these cases, the lungs being pale in some portions and hyperemic in others. Symptoms of beginning edema were sometimes present.

Upon microscopic examination, emphysema was found in some areas, atelectasis in others, and alterations in the lining of the small arteries were also observed. Masses of red-blood cells, fibrin filaments, and leukocytes, were observed in the vessels. In one instance, a rupture in the wall of a good-sized arteriole was found.

These anatomical findings give no explanation for sudden deaths such as described by the writer. The pressure under which air is introduced must make considerable difference in the result, but the writer's conclusions are that neither as a result of experiment nor clinical observation can the theory that the entrance of air alone into the vessels of the uterus or other vessels, be responsible for death. In order to prove this, the heart and great vessels must be ligated and removed and examined critically.

The writer's illustrations are excellent.

The reviewer agrees with the writer in his skepticism concerning the presence of air in these cases as the cause of death. In the *Transactions of the American Gynecological Society*, 1905, the reviewer contributed a paper based upon his own experience, and cited numerous instances in which air had been introduced into the circulation without serious results. Furthermore, it cannot be proven in any of these cases that the gas present in the blood was atmospheric air.

In the reviewer's paper, the only tangible cause found for pulmonary embolism was previous infection of the air passages. In one of his cases, influenza during pregnancy had preceded sudden death at the conclusion of labor. We now recognize infection of the air passages by the influenza bacillus, the streptococcus, the pneumococcus, and other germs, as the frequent cause of pathological conditions, not only of the pulmonary tissue but of the blood itself. An altered state of the blood

with the mechanical disturbances incident to parturition, or operations upon the pelvic tissue, can readily induce the formation of an embolus. The mechanical conditions of the circulation are such that the point of election for such development would be the right heart and pulmonary artery.

While treatment in these conditions is usually unavailing, the only cases in which recovery has occurred have been those in which active stimulation was practised, maintaining the heart's action, and noticeable by the free use of ammonia. This tends to dissolve the clot, and to force it out of the cardiac chambers and great vessels to a point where it may do less damage. If manipulation of the uterus and the entrance of air into the uterine sinuses were the cause of air embolism and fatal clot, the mortality of manual removal of the placenta and Cesarean section, where the placenta is often under the incision, would be greatly increased.

Schenck¹ contributes a very interesting paper upon *thrombosis and embolism following operation and childbirth*. He recognizes three types: One, where the pelvic veins alone are involved without gross infection, and with few symptoms. In the mild form, this condition is common, and, in somewhat more severe degree, in cases in which there is slight fever and altered pulse, with pains in the groins and disturbance in the intestine. From these cases often occurs sudden pulmonary embolism.

Thrombosis of the deep veins of the leg is more frequent, and, if the legs are disturbed by massage, embolism may occur, but with ordinary caution the danger is not great. When the thrombosis is developing, emboli are most apt to form.

The third variety is that of thrombosis of the saphenous veins, with redness of the skin and palpable vessels, the pain, swelling and edema being less severe than when the veins were affected. Embolism does not occur in these cases.

Seven writers reported, among 96,000 obstetrical cases, 381 of femoral thrombosis, or 1 in 250. Among these 96,000 cases were 44 fatal pulmonary emboli, or 1 in 2500. After gynecological operations, thrombosis is more frequent—1 in 87. After abdominal sections, the percentage is 2.28; after myoma operations, 3 per cent. Mechanical and biochemical causes produce the condition.

Among the first are those which injure the walls of the vessels and slow the blood-stream. Of the biochemical causes, bacteria and the products of bacteria, and, most important, certain poisons are significant.

As regards the thrombosis which follows operations and delivery, and which is not accompanied by symptoms of septic infection, opinion is divided as to the infective nature.

¹ Surgery, Gynecology, and Obstetrics, November, 1913.

It seems probable, however, that while nine-tenths of these thrombi are sterile, so far as *aërobic* bacteria are concerned, other germs may be present. The fact that thrombosis is more frequent in the left leg favors the argument for the mechanical cause. Small thrombi in the pelvic vessels are frequently found which have given rise to no symptoms whatever during the life of the patient. Varicose veins also predispose to thrombosis. Injury to vessel walls, slowing of the circulation, and conglutination of blood-platelets, and red corpuscles, are the most important causes of thrombosis. Hemolysis is especially effective in bringing about this condition, and as hemolysis is usually the result of the action of microorganisms, especially the colon bacillus, we must believe that many cases of thrombosis result from the action of this germ.

As regards the symptoms, Mahler's pulse sign has been confirmed, and variations in temperature have been observed. Chest pains of varying severity are thought significant by Mahler, and are undoubtedly so. Pain in the groin and leg are frequently observed. Enlargement of the threatened leg, and increase in local temperature, are also present.

As regards prophylaxis, this must be kept in mind before operation or delivery. All injury to veins should be avoided so far as possible. Tight bandages constricting the tissues about the groins, and preventing motion, must be avoided.

After operation, the majority of opinion is now in favor of early motion and early getting up. Passive motion of the legs and thighs, begun on the second or third day by the nurse, has been adopted by the writer with excellent results.

When thrombosis has developed, the elevation of the affected leg upon a broad and comfortable support, the application of heat or cold, as desired, soothing applications, as lead water and laudanum, and the use of a light bandage, are all advisable. The exposure of the leg to the ultraviolet ray, and, in the later stages, support and massage, are also indicated.

The prognosis as to complete restoration must be guarded.

The writer mentions Trendelenburg's experiments to determine the possibility of opening the pulmonary artery and extracting an embolus. No case permanently successful has been reported.

In obstetric cases it is difficult, in the present state of our knowledge, to find an adequate cause for thrombosis following delivery. The ordinary septic infection is not present in many of these cases, nor is it necessary for the development of the condition that labor should have been prolonged or especially difficult, or terminated by operation.

In 165 Cesarean operations, the writer has seen the condition but once in the femoral vein, and once in a permanently dilated saphenous vein, the patient stating that after the birth of each child this vein became sore for a few days. In neither case was the condition grave. The statement that pain in the chest precedes the development of thrombosis

in the femoral vein has been verified in the writer's observation. Menstruation, occurring after delivery or operation, sometimes precedes or accompanies this complication. This would indicate that an abnormal condition of the blood might be an essential element in producing this phenomena.

The Stimulation of Uterine Contractions and the Induction of Labor. The use of *pituitrin* still attracts attention, and various experiences are reported as to its value in stimulating uterine contractions.

Stolper¹ reports two cases. The first was a multipara whose first child had been excessive in size and development. In the second pregnancy, the patient went to term, and was given three injections, 1 c.c. each, of pituitrin. This finally induced efficient uterine contractions, followed by the spontaneous birth of an abnormally large child.

The second patient was also a multipara who had had large children, abnormal mechanism, and difficulty in labor. On one occasion, a partial placenta previa had been present. There had been vague, indefinite pains at night for some time. The child was evidently very large. As labor did not develop at term, pituglandol was given—in all, four injections of 1 c.c. each. Active labor finally developed, with the birth of an excessively large child.

The *influence of pituitrin upon the child* was discussed by Spaeth² who reports the case of a primipara with normal pelvis, the child in breech presentation, and labor prolonged, with the escape of meconium. Two injections of pituitrin were given of 5 c.c. each, followed by efficient pains, with descent of the breech and the rapid and easy extraction of the child. The umbilical cord was once around the neck, but was not compressed. The child was asphyxiated, with slow heart beat, and died half an hour after birth.

At autopsy, no anatomical cause for the child's death could be found.

The writer calls attention to the fact that different preparations of pituitrin on the market differ greatly in intensity and effect. *Vaporole* and *pituglandol* are European preparations, and are less active and can be given in larger doses than the preparations usually employed in the United States.

Gisel³ writes concerning the action of *pantopon* and *pituglandol* in promoting uterine contractions. He combines these substances, with excellent results. Pantopon seems to lessen the patient's sufferings, and, in doses of 0.04, does not lessen the vigor of uterine contractions. These substances should be used only during the period of expulsion, when there is no obstacle to delivery.

Vogelsberger⁴ has used pituitrin to bring on labor, and, at the same time, *galvanization*.

¹ Zentralblatt f. Gynäkologie, No. 5, 1913.

² Ibid.

³ Ibid.

⁴ Archiv f. Gynäkologie, 1913, Band xcix, Heft 3.

His series embraces 18 cases, and to induce labor he places a cathode in the cervix against the posterior wall. An anode of medium size is placed upon the abdomen over the uterus. The current is from 10 to 15 mm. When the pains become strong, the anode is removed from the abdomen, and the current is continued until spontaneous contractions develop. Unless labor proceeds very promptly, the application should be renewed in not less than two hours. If, at the first application, there are no uterine contractions, an effort is made on the following or on the second day. If the cervix is so tightly closed that the cathode cannot be introduced, it is often possible to select a small one in the form of a uterine sound. In these cases, a large anode should be employed and placed across the abdomen. The current is applied from ten to fifteen minutes. Vaginal douches are unnecessary, and may be a source of danger.

In six cases, labor was induced before the termination of pregnancy. The pains were developed by the electric current and pituitrin given as soon as they developed. The indications were, premature rupture of the membranes, pernicious nausea, osteoporosis, abnormal pelvis, heart lesions, and a history of having lost a child previously, the mother having great edema.

As to the time when labor was brought on, it was once at the eighth month, twice at the beginning of the ninth month, twice at the end of the ninth month, once at the beginning of the tenth month. In one case, twelve applications of the current were necessary, each varying from fifteen to thirty minutes. In 3 cases there were three applications; in 2 cases, two each.

The puerperal period of the patients was normal, and the children did well.

He also reports 4 cases in which labor failed to come on at the usual termination of pregnancy, and pains were excited by galvanism and pituitrin. In these cases, the method was satisfactory.

In comparing this series of 4 cases with the 6 of induced labor in the earlier months, the results are better in the latter than in the former cases. The uterus responds in the later months more readily to artificial stimulation.

He closes his list of cases with 5 in which the method was carried out at the normal termination of pregnancy. The results were satisfactory in these.

In summing up his experience in the 18 cases, he could find no injury done to mother or child. The method was reliable so far as accomplishing its purpose was concerned, and seemed efficient in the last three months of pregnancy, and especially so at the normal termination of gestation. When pregnancy is to be terminated comparatively early, the use of artificial methods for dilating the cervix seems more efficient. Among the disadvantages are the fact that much time is required, and

that the applications of the electric current are painful and disturbing to the patient, although less so than had been asserted by others. The use of the electric current makes some patients excitable and nervous, and seems soothing to others. In some, the use of the anode creates irritation of the skin, with redness and a feeling of burning, but without the actual formation of blisters; and in one case, the intra-uterine application of the current injured the mucous membrane of the cervix.

In citing the advantages of the method, it seems to resemble a physiological process as closely as possible. The method seems especially valuable to secure dilatation without interference, thus avoiding the dangers which accompany laceration. It is also better than the premature rupture of the membranes. It avoids the risks of interfering with the placenta, and disturbing the presenting part—risks which pertain to the use of the bougie and the dilating bag. It seems less likely to cause endogenous infection. Other methods expose the patient to greater danger of premature rupture of the membranes and alteration in the secretions of the birth canal.

THE INFLUENCE OF THE THYROID PREPARATIONS IN STIMULATING UTERINE CONTRACTIONS. Mosbacher¹ has experimented upon animals to determine the action of thyroid material upon uterine muscular fiber in warm Ringer solution. The preparation of thyroid selected is that known as *thyroglandol*. This substance is also compared in these experiments with adrenalin. In his clinical observations in 41 patients in which 2 c.c. of thyroglandol, or more, was injected, 12 showed considerable increase in uterine contractions and in the strength and vigor of each action. The frequency of the pains increased, and the duration from thirty-one to sixty-five seconds. In 12 cases where thyroglandol failed, it was combined with adrenalin, and in 7 very prompt and satisfactory results followed.

Welz² reports 6 cases of pregnancy treated by the injection of fetal serum to bring on labor. As reported, the results of these injections were favorable in 4 out of the 6. He also reports the action of pituitrin in common with that observed by others.

Edgar³ concludes, from his experience, that ampoules or vaporoles of pituitrin should alone be used, as the pituitary extract in bulk solution is not reliable. Three of the preparations of the drug commonly sold were tested and found reliable. For decided action, $\frac{2}{10}$ gram is required, but, in ordinary cases, one-half of that dose is sufficient. The effect of the drug lasts but thirty minutes, and the dose must often be repeated. The best method of administration is by intramuscular injection, which caused no local pain or reaction. No toxic symptoms were observed. When pituitary extract fails, it may be combined with ergot, and when the heart action is feeble, heart stimulants may be used with pituitrin.

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band Lxxv, Heft 2.

² American Journal of Obstetrics, July, 1913.

³ Ibid.

In normal labor, the drug should not be given, but in primary and secondary inertia, in postpartum hemorrhage, and as a substitute for ergot in Cesarean section, the drug is useful. The uterine contractions which it produces are strong and intermittent, and often prolonged for several minutes. Tetanus of the uterine muscle was not observed.

When dilatation is not complete and there is much resistance, the contractions produced by this substance are practically continuous. If full or even small doses of the drug are given in the first stage of labor, the child may be killed by birth pressure, the placenta prematurely separated, and the cervix deeply torn. When the head is not sufficiently low to be safely reached by the forceps, small doses of pituitrin may be given, to bring the head lower. Where inertia in the first or second stages is present, pituitrin acts well, especially in multiparæ; also in women at full term, and in the second stage of labor shortly after the rupture of the membranes.

When the drug was used immediately after the third stage for postpartum hemorrhage, the action was unreliable and inferior to that of ergot. In 18 postpartum cases, the drug was inert in 2; ergot was required in 2; and hot aseptic acid douches in 2. It was necessary to pack the uterus in 7, and in only 5 did the drug cause efficient uterine contractions.

The only advantage over ergot in Cesarean section seems to be that pituitrin acts more promptly and need not be given quite so early in the operation. The drug failed to induce labor when gauze packing, bougies, or the dilating bag was used, but seemed to strengthen uterine pains. In abortion, when the uterus failed to promptly expel the ovum, the drug was inert and unreliable. In the puerperal period, where there was atony of the bowel and bladder, or when it was desired to increase the secretion of milk, the drug had no effect. Unless given carefully, pituitrin, when administered for inertia in the first or second stage of labor, may produce severe injury. It should not be given in the first stage of labor because of the danger of destroying the fetus through birth pressure, lacerating the cervix, or separating the placenta. When the cervix is not fully dilated, pituitrin is more dangerous than ergot, as it produces more powerful but uncertain uterine contractions. Unfortunately, the action of the drug is most uncertain. It cannot be told from the amount given, or the condition of the case, how powerfully the drug will act upon the uterus, and whether it may not ultimately cause tetanus of the uterine muscle. In both private and hospital practice, $\frac{3}{4}$ gram of pituitary extract repeatedly caused such powerful and prolonged uterine contractions that uterine rupture was threatened, and anesthesia was required to control the action of the drug.

The drug should never be given for inertia at any time during labor, unless the obstetrician is ready to use anesthesia, and ready to proceed to operative delivery immediately if uterine contractions become

violent. With strict limitations, the drug may be of considerable importance.

In the *Monatsschrift f. Geburtshülfe und Gynäkologie*, Band xxxvii, Heft 3, 1913, van der Hoefer compares the different methods of artificial delivery in their various statistics, especially with the view of determining the value of induced labor. Spontaneous birth is undoubtedly safest for the mother, even though complications arise in pregnancy, and puerperal sepsis may develop after spontaneous birth. The recent statistics of Holland give a mortality of 0.25 of 1 per cent. for the mother in spontaneous labor, and 3 per cent. for the child. In contracted pelvis, if the labor is spontaneous, the mortality rate for the mother is but slightly increased. The greater the pelvic contraction, the higher the mortality rate for the child, so that the fetal mortality is increased from ten to thirty times, as the pelvis becomes more deformed. When version and extraction are practised, the maternal mortality is, in the average, about 1 per cent., and one-half of this mortality arises from rupture of the uterus.

Next in frequency is infection, bleeding from lacerations in the cervix, or accidents of anesthesia. When the pelvis is normal and version and extraction are practised, the fetal mortality rises to 14 per cent. or more, and if pelvic contraction be present, it is much increased.

The high application of the forceps shows for the mother a greater mortality than version and extraction, ranging from 2.9 to 15.5 per cent. It is difficult to accurately appreciate the mortality of high forceps, for some of the factors which suggest the performance of the operation tend themselves to increase the mortality. The mortality for the child in high forceps application varies from 20 to 40 per cent. Version and extraction and high forceps, even in good hands, give so high a fetal mortality as to seriously jeopardize the position of these operations. As a rule, the difficulty lies in the disproportion between the fetal head and the maternal pelvis. This would indicate the induction of labor, the enlargement of the pelvis, or the performance of Cesarean section.

In premature labor, the writer believes that the one rational and reliable method consists in rupturing the membranes, and he believes that this is attended with a maternal mortality but little above 1 per cent. For the child, the mortality ranges from 13.4 to 20 per cent., while by the introduction of bougies the fetal mortality is from 15.6 to 51 per cent.; and with the use of the dilating bags from 29.7 to 51 per cent.

Rupture of the membranes improves the prognosis for the mother slightly, but for the child very considerably. The favorable time for the induction of labor is four weeks before full term, when the weight of the child is approximately 2.5 kilograms. The average biparietal diameter of the fetal head is then from $8\frac{1}{2}$ to 9 cm.

Induced labor should not be practised unless the true conjugate is

greater than 8.5 cm. It is essential for the success of induced labor that it should terminate spontaneously. If the head is so large that this becomes impossible, labor has been induced too late.

When hebstiotomy is considered, the maternal mortality is estimated at 5 per cent., and, unless the cases are selected carefully, may be considerably greater. The mortality for the child varies from 4.7 to 12.1 per cent.

For Cesarean section in all classes of cases, the mortality during the last few years has been reported as ranging for the mother from 2.3 to 25 per cent. — an average of 10 per cent. This is unjustly high, as many cases of death after section arise from causes with which the operation itself has nothing to do. The mortality for the child is given at from 1 to 16 per cent.

The comparison in these statistics leads the writer to emphasize the fact that spontaneous labor should be brought about, if possible, and every care taken that the fetal cranium is not subjected to severe pressure. For all cases of labor which do not terminate spontaneously, he believes that hospital care is clearly indicated; and in cases in which the true conjugate is reduced to $9\frac{1}{2}$ cm., he believes that hospital care is imperative.

In the *Zeitschrift f. Geburtshülfe und Gynäkologie*, 1913, Band lxxiii, Heft 3, van der Hoefer contributes a paper on the premature rupture of the membranes in labor, in reply to a criticism by Basset ¹.

In the *Zeitschrift f. Geburtshülfe und Gynäkologie*, 1912, Band lxx, Heft 1, van der Hoefer published an extensive paper advocating the premature rupture of the membranes as a safe means for terminating labor. In reply to the criticism, he emphasizes the fact that he would limit this method of treatment to vertex presentation only in the normal pelvis, and that the presentation and position must be normal and favorable.

As regards the criticism that this method predisposes to prolapse of the umbilical cord, when the patient after this is placed upon her side in bed, prolapse of the cord occurs in but 0.2 of 1 per cent.

Labor After Antefixation by Operative Means. The dangers resulting from artificial antefixation of the uterus are illustrated by an interesting case reported by Kuster.²

The patient was a multipara who, five years before coming under observation, had anterior and posterior colporrhaphy and vaginal fixation of the uterus to cure prolapse. Before the operation, the patient had passed through four labors, difficult, one of them terminated by forceps, and two abortions. After the operation, she had an abortion at two months. When her last pregnancy occurred and grew toward its close, she had contractile pains in the abdomen, a distressing sensa-

¹ *Zeitschrift f. Geburtshülfe und Gynäkologie*, 1913, Band lxxiii, Heft 2.

² *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1914, Band xxxix, Heft 2.

tion of tension in the lumbar region, the escape of fluid slightly tinged with blood from the vagina, and the gradual cessation of fetal movements.

Upon admission to the hospital, the patient was very stout and flabby in appearance, the abdomen much distended, with an edematous swelling above the symphysis. The highest point of the uterus was a hand-breadth beneath the tip of the sternum, and the abdomen was more distended from side to side than longitudinally. The abdominal wall was thick and tense, and it was difficult to palpate it accurately. Fetal heart sounds could not be heard.

Upon internal examination, the os was partly dilated, the cervix very high up, the posterior lip well above the promontory of the sacrum, and the anterior lip above the symphysis. The actual opening into the uterine cavity seemed to be immediately in front of the spinal column. A bag of membranes containing fluid protruded from the cervix.

It was impossible to reach the head because the body of the uterus and fetus were so high above the pelvic brim. Upon introducing the hand and arm to the elbow, a foot was seized and brought down gradually to the vulva. This was, after some hours, followed by strong pains, the patient having a slightly subnormal temperature and a rapid pulse. The anterior hip was gradually born and the child delivered a short time after. Following this, the patient had shock, rapid, weak pulse and clammy perspiration, with respirations increasing to 72 to the minute. The placenta was not expressed but removed by the hand, and the patient died in about two hours with distressing air hunger and rapid pulse.

The child was about the average in size and weight, greatly macerated, and had evidently been dead for some time.

At autopsy, air was found in the right side of the heart, the liver was fatty, there were signs of previous disease in both kidneys with moderate hydronephrosis, and the ureters were somewhat dilated.

Upon examining the uterus, where the placenta had been attached the uterine wall was exceedingly thin, infiltrated with blood, the posterior wall of the uterus had been the portion in which the child had developed, while the anterior wall fixed by the operation, was excessively thinned and distended. Rupture of the uterus had occurred, followed by embolism.

Labor Complicated by Hemorrhage from Ruptured Uterine Veins. Langes¹ reports the case of a patient in her second pregnancy who had pain six weeks before full term. After this had persisted for about fifteen hours, she was suddenly seized with violent pain in the abdomen and a sensation as of something tearing within. The abdomen became excessively sensitive to the touch. The pains gradually ceased, and seven hours after the attack of pain the patient became pulseless and unconscious for a short time. She rallied from this and had a pulse of

¹ Zentralblatt f. Gynäkologie, No. 15, 1913.

90, small and weak. The abdomen was much distended, tense, and sensitive, so that little information could be obtained by palpation concerning the condition of the uterus. The heart sounds were heard beneath the umbilicus, 150 to the minute.

Upon vaginal examination, the cervix admitted two fingers, the membranes were unruptured, and the breech of the child was movable above the pelvic brim. The patient was brought to hospital and the membranes ruptured, followed by the discharge of two quarts of amniotic liquid not tinged with blood. As the breech was presenting, a foot was brought down with the hope that spontaneous labor would develop. The pains were very weak, and the patient was dull and apathetic. Stimulants produced no effect upon the pulse, and there seemed to be dulness in the left portion of the abdomen, which gradually increased.

As the patient suffered much from air hunger, the abdominal region of dulness was pierced with a trocar and cannula, and fresh blood escaped through the cannula.

As soon as possible, abdominal section was performed. There was much free blood in the abdomen and the blood seemed to come in a thick stream from a small laceration under the serous covering of the uterus on the left side and posteriorly at about the level of the internal os. This region was at once compressed, the uterus incised, a dead child extracted, and supravaginal hysterectomy performed. The patient did not rally from the operation, dying two hours later.

Autopsy upon the body of the mother showed nothing abnormal, except excessive blood loss and its results.

When the amputated portion of the uterus was examined, on the left side posteriorly near the internal os, was found a defect or aperture of the peritoneal covering of the womb. A sound could easily be introduced at this point and enter the uterine veins. Upon further investigation, it was found that the uterine vessels had ruptured, and that through this solution of continuity in the serous covering free bleeding had occurred. The large vein which had torn was very thin-walled and varicose.

Similar cases are reported in the literature, and the condition is analogous to rupture of the splenic artery, which is sometimes the cause of death. The peritoneal covering at the point of rupture seemed to have undergone a process of fatty degeneration or infiltration.

The reviewer had a similar experience in the case of a woman with an ill-developed uterus, delivered in her first labor by Cesarean section because descent and engagement failed, and the cervix dilated but partially.

Following this, another pregnancy occurred, complicated by pain in the right, lower abdomen and the presence of a cystic tumor in Douglas' cul-de-sac.

Upon abdominal section, it was found that the patient had a cyst

of the right ovary, and, in addition, chronic appendicitis. The appendix and cyst were removed without incident.

When the pregnancy came nearly to term, elective section was performed in the interests of mother and child. On the right side of the uterus, the uterine veins were greatly dilated and varicose, and the stump of the right broad ligament, and, for a short area, the intestines, were adherent to the right side of the uterus. In the manipulation necessary to deliver the child, and in the subsequent contraction of the uterus, these adhesions tore, wounding the peritoneal covering of the womb and opening some of the vessels. The hemorrhage was immediately profuse, but was checked by over-and-over suture with two rows of continuous catgut. The hemorrhage was brief and did not continue sufficiently long to greatly weaken the patient.

On the third day after operation, the patient was taken with symptoms of obstruction of the bowel, and, as other treatment produced no result, the abdomen was reopened. A kink in the bowel completely occluding it was found at the point where the adhesions had been, whose separation had caused bleeding. The patient died soon after the second opening of the abdomen.

The patient was toxemic during her pregnancy, and before and after operation would not permit the use of some methods of treatment which ordinarily prove successful in relieving the bowel of gas and keeping open the lumen of the intestine.

Labor Complicated by Hematoma of the Abdominal Wall. Vogt¹ calls attention to 2 cases of a similar nature reported by Stoeckel.²

The writer's case was that of a patient in her second pregnancy, who was examined by palpation frequently before labor began. When labor came on, it terminated spontaneously, and was apparently normal throughout.

A few hours after labor the patient complained of severe pain directly above the symphysis. Upon inspecting the abdominal wall, nothing was seen except the striae of pregnancy. In the lower abdomen, above the symphysis, were two superficial tumors over which the skin and fascia could be readily moved. By careful examination, and by shifting the position of the patient it was observed that these tumors were in the lower ends of the recti muscles, and pertained to the muscles or the tissues immediately about them.

With rest, and the use of an ice-bag, the size of the tumors increased for three days, but they became less painful. The patient was discharged on the twenty-first day, when the tumors had become somewhat smaller and were comparatively painless. Four weeks afterward there was no trace of the tumors, but the wide separation of the recti muscles. This the patient said had existed for some time.

¹ Zentralblatt f. Gynäkologie, No. 14, 1913.

² Ibid., No. 10, 1901.

No cause is assigned for the development of the tumors, unless from repeated palpation to determine the position of the fetal head.

The Anteroposterior Position of the Head at the Pelvic Brim Complicating Labor. Pankow¹ describes several cases in which the head was in the anteroposterior diameter of the pelvic brim and high above the pelvic cavity. He believes that this condition is not as rare as is often stated. Usually the occiput is behind the pubis, and rarely at the sacrum; and the same relative position may be seen in breech presentation, especially in face and brow presentation. Contracted pelvis unquestionably causes some of these cases. It is not the only, nor the chief cause of the condition. It probably results from some unusual position of the fetal body. Spontaneous labor is not impossible under this condition, and, in his experience, occurs in more than half of the cases. When the occiput is behind the pubes, the sagittal suture enters the pelvis anteroposteriorly and passes in this position through the pelvic cavity to the floor; or the sagittal suture rotates into an oblique diameter at the pelvic cavity. When the occiput is directed toward the sacrum, labor is impossible except by rotation, and usually proceeds as a typical occipital presentation.

In treating these cases, interference must be avoided if possible, and every effort made to secure normal engagement and rotation. In some cases, rotation with the hand may be useful.

Hematoma of the Vulva Complicating Labor. Zubrzycki² reports the case of a multipara, who, during a somewhat tedious labor, was found by the midwife in attendance to have a swelling on the vulva, which increased in size, and for which cold applications were applied.

Upon examining the patient, a hematoma of the left portion of the vulva was found, covered by a very thin bluish membrane, and fluctuating on pressure. The fetal head was in the pelvic cavity, the occiput obliquely behind, the smaller fontanelle in front.

While examining the patient, the vulvar tissue ruptured, and a large quantity of blood-clot and fresh blood was expelled. This was followed by severe hemorrhage. The child was delivered by forceps, and the placenta delivered without difficulty. Ergotin and pituitrin were given to secure uterine contractions.

As free hemorrhage persisted from the bed of the tumor, it was packed with gauze after some bleeding points had been tied, and the edges of the covering of the tumor were brought together over the gauze. The patient made a good recovery.

Labor Complicated by Fibroid Tumors. In the *Zentralblatt f. Gynäkologie*, No. 8, 1913, Strassmann reports the case of a patient about twelve hours in labor with normal pelvis, and at full term. On the right side of the uterus was a tumor as large as a fetal head, and the tumor was

¹ Monatsschrift f. Geburtshülfe und Gynäkologie, 1913, Band xxxviii, Heft 2.

² Zentralblatt f. Gynäkologie, No. 8, 1913.

accessible through the vagina. It was removed through the vagina by incising the uterine membrane in the cervical canal, splitting the capsule, and enucleating the tumor. As soon as this was done, the child was delivered by forceps, the placenta removed, and the site of the tumor tamponed with iodoform gauze. The gauze tampon was removed on the eighth day, but gradually cut off, the patient and child making a good recovery.

In a second case, an effort was made to replace the tumor under anesthesia, and the diagnosis of ovarian tumor was made. Reposition failed, the posterior wall of the vagina was incised, and a solid tumor delivered.

As the head was too high to permit the use of forceps, version was performed, and some difficulty found in bringing the child over the bed of the tumor. The placenta was expressed, but considerable hemorrhage persisted from the uterus, which was relaxed and could not be brought to contract. An intra-uterine tampon of gauze was inserted, and firm pressure made. The uterine gauze was removed in twenty-four hours, and the gauze from the site of the tumor in six days. Mother and child made a good recovery.

Abdominal Cesarean section was declined because the tumors were in the pelvis, accessible through the vagina, and because it was feared that infection had occurred through delay in labor.

The Use of the Elastic Bag in Labor, Complicated by Fibroid Tumor. Christiani¹ describes the case of a multipara, aged thirty-seven years, to whom he was called in consultation. The membranes had ruptured prematurely, and a solid and semi-elastic tumor filled the greater portion of the pelvic cavity. The tumor was moved with difficulty.

Under anesthesia, it was possible to push the tumor up so that but part of it still projected into the pelvic space at the brim of the pelvis. The cervix was pulled down with tenaculum forceps, and an elastic bag introduced into the cervix, which prevented the dropping downward of the tumor. Labor developed, and the bag was expelled spontaneously, while the tumor had been retracted above the pelvic brim. The head then engaged.

It was found that the patient had a flat pelvis of moderate contraction. The heart sounds had ceased, as she had been long in labor. The head was then perforated, and the patient finally delivered the head spontaneously. Some difficulty was experienced in delivering the shoulders, as they were unusually broad. The patient made a good recovery.

Four months afterward the tumor was the size of two fists, and movable on the right side above the pelvic brim. The patient was then two months in her second pregnancy. Operation was proposed, but rejected,

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiii, Heft 2.

and the patient went to term and gave birth to the child spontaneously without complications.

A Method of Diagnosticating the Degree of Dilatation of the Cervix during Labor, without Internal Examination. To avoid the risk of infection which accompanies internal examination, Unterberger¹ has devised a method which is based upon observation of the size of the cervix in cases operated upon by suprapubic Cesarean section. He has tested this in 285 cases where the diagnosis was correctly made. In 15 cases, the method failed. It is based upon the presence and situation of the lower edge of the upper expulsive uterine segment, which is commonly known as the contraction ring. While this may not be strongly developed in normal labor, it is always present, and, to recognize it, the urinary bladder of the patient must be completely emptied, and the patient must be examined during a pain. The difference between the thin elastic lower segment and the sharp edge of the upper segment becomes then plainly apparent. The writer finds that when this muscular edge is two finger-breadths above the symphysis the size of the os corresponds to a 5-mark piece, about as large as a silver dollar. When this edge is three finger-breadths above the pubis, the os is the size of a small saucer or plate. When four fingers can be placed between the pubis and this muscular ring, full dilatation is present. At that time, the ring extends squarely across the uterus and not obliquely, as it does in cases where the lower segment is excessively distended.

Methods of Disinfection of Practical Value in the First Stage of Labor. To solve this question Leidinus, in the Helsingfors clinic, has made extended and very careful experiments, the results of which are published in the *Archiv f. Gynäkologie*, 1913, Band c, Heft 3.

He finds that the disinfection of the vulva is of undoubted value, as it lessens the number of bacteria in the uterus. To be most efficient, these parts should be shaved and painted with tincture of iodine. If to this is added vaginal irrigation with boiled water, the number of bacteria is also reduced by the mechanical effect of the irrigation. When mild antiseptics, as hydrogen peroxide, or lysol 0.5 per cent., are employed, a still greater result is produced.

These measures affect equally the various sorts of bacteria, and there seems to be no difference in this regard between primiparae and multiparae. The length of labor and the time at which the membranes rupture, have no influence upon the number of bacteria contained within the uterus. At the end of the first week, the bacterial content of the uterus is somewhat greater than in the beginning of the puerperal period. This also is true of those cases that have fever during the puerperal period.

To make a practical application of these interesting findings, one must remember that these procedures were carried out under the most

¹ Zentralblatt f. Gynäkologie, No. 4, 1914.

careful precautions in a well-appointed clinic. We do not believe that this should be done in cases conducted in private houses, but it is unquestionably true that the vulva should be disinfected as thoroughly as possible in all cases. In hospital practice, we have used for disinfection of the vulva, and a preliminary vaginal examination, irrigation with lysol and tincture of green soap for some time, with the best results.

Labor Complicated by Rupture of the Umbilical Cord. Nebesky¹ has observed in the Innsbruck clinic, 18 cases of rupture of the umbilical cord complicating labor.

He finds that, when no other factors are present, the weight of the child is sufficient to produce laceration of the umbilical cord. In the case of a premature child, the strength of the umbilical cord is less than in those at full term. Rupture usually occurs in the fetal third of the cord; much less frequently in the middle and placental thirds. When labor occurs suddenly—often while the patient is standing—the danger to the child from rupture of the umbilical cord is small in comparison with the danger of injury to the cranium; and if the child breathes promptly, no dangerous hemorrhage will occur. When, however, the cord has a velamentous insertion and some of the vessels rupture, or when the umbilical vessels are torn by excessively strong uterine contractions, the danger to the child becomes very great. It is practically impossible to distinguish between spontaneous and artificial rupture of the cord during labor. When uterine contractions are excessively strong, or the resistance to the passage of the child is suddenly lessened, complete rupture of the cord may occur, especially if it be abnormally short. Coils of the cord, and abundant, or the lack of, Wharton's jelly, have no special influence in producing rupture. When there are varicosities in the vessels, and when the vessels are looped, the danger of rupture is greater, although it does not often occur at the site of the abnormality. In cases in which the structure of the umbilical cord is histologically abnormal, its vessels may rupture without mechanical cause. In these cases, the elastic fibers in the walls of the vessels are lacking, or there is abnormality in the muscular development of the muscles or in the connective tissue surrounding them.

An unusual case of OBSTACLE TO LABOR THROUGH DISTENTION OF THE FETAL URINARY BLADDER AND RUPTURE is reported by Bohi.²

The patient was a primipara, aged twenty-three years, admitted to hospital in labor, with no history of rupture of the membranes. Upon external examination, the abdomen was ovoidal, and upon palpation it was possible to make out fluctuation. On the left side, near the umbilicus, there seemed to be some fetal portion which was little movable. The heart sounds were in the median line, two finger-breadths beneath the umbilicus, and difficult to detect. The pelvis was practically normal.

¹ Archiv f. Gynakologie, 1913, Band c, Heft 3.

² Ibid., 1914, Band c, Heft 3.

Upon vaginal examination, the os was considerably dilated, and a tense cystic tumor with thick walls was presenting. Strong pains developed, but labor made no essential progress, although the tumor became at times visible at the vulva. On perforating it, and introducing the finger, about three quarts of fluid escaped and the abdomen of the mother became evidently smaller.

Upon examination, the feet of the child could be grasped, the fetus gradually descended, and shortly after was expelled. Upon examining the body, it was found that excessive distention of the urinary bladder had been present.

The Influence of Age upon the Complications of Labor. Zweifel, from Doederlein's clinic in Munich, has studied the records of 10,000 cases of labor, and published the results in the *Archiv f. Gynäkologie*, 1914, Band ci, Heft 3.

In presentations, he finds the face more frequent among multiparæ than primiparæ. His statistics of the various presentations and positions coincide closely with those of other reports.

As regards breech presentation, its frequency increases with the age of the mother. This also is true of transverse positions. The use of forceps is more common among primiparæ than multiparæ, and Cesarean section was more frequent among primiparæ. Vaginal Cesarean section was especially selected in cases of eclampsia. Contrary to what is often believed, the fetal mortality during labor is greater in multiparæ than primiparæ, the longer labor in primiparæ apparently having less influence in the fetal mortality than the transverse positions and placenta previa, which occur more often in multiparæ.

The total number of operations for delivery was greater among multiparæ than primiparæ, the general frequency of operation being 10 per cent.

Complications Produced by Labor. Solomons¹ examined 543 primiparæ sixteen days after labor, finding 219 in normal condition, 219 with the cervix only lacerated, 27 with subinvolution, and 25 with retroversion and cervical lacerations. Pyosalpinx was present but once.

He believes that *cervical laceration* in normal labor is very common. Should this be accompanied by hemorrhage, immediate suture is indicated. If not, the cervix should be closed in two months, or the condition should be allowed to remain undisturbed until the end of the child-bearing period, when the cervix should be closed. When there is no pelvic inflammation, postpartum retroversion of the uterus is the result of the dorsal decubitus.

The best treatment for this complication is better posture, and par-turient patients should be examined once a month for at least four months after confinement.

¹ Journal of Obstetrics and Gynecology of the British Empire, July, 1913.

Should a torn perineum fail to close after suture, a second operation should be done immediately, provided the case is not septic. In the present state of our knowledge, it is impossible to state definitely that early rising in the puerperal period is always beneficial. Active movements of the limbs should be encouraged after the first few days of the puerperal period have passed.

The *treatment of obstructed labor* was the subject of a discussion opened by Wilson.¹ An accurate definition of this condition is difficult, as the obstruction may vary so greatly in degree. The most frequent cause for neglected cases was failure on the part of the family or midwife to call a physician promptly. To remedy this, attention should be given in medical education to obstetric diagnosis, and in multiparæ the previous history is especially valuable.

Cases of moderate pelvic contraction only are dangerous, as they attract little attention until complications arise.

The induction of labor should be avoided in first pregnancies. Special attention should be paid to asepsis and antisepsis in cases where difficulty is expected. The skilful use of forceps, and in selected cases, craniotomy, are often necessary.

ABORTION.

The Relation between Habitual Abortion and the Internal Secretions. Lehmann² has endeavored to discover the causes of habitual abortion. He finds that the male fetus is more susceptible to those processes which destroy fetal life than is the female type.

The endeavor to connect the occurrence of abortion with abnormal conditions in the internal secretions was not successful. The serum tests were employed, and also the calcium content of the blood was taken into consideration. Chemical tests gave no result.

The anatomical and pathological causes of abortion have been studied by Sirtori.³ He finds that alterations in the bloodvessels of the chorion, which often manifest themselves in Langhans' layer, are the most frequent cause for abortion.

The Bacteriology of Abortion, with Fever. Werner,⁴ in 45 cases of abortion with fever, had a mortality of 9 per cent. in 4 patients; 3, or 6.6 per cent., had severe complications; 2 had mild complications; and 36, or 80 per cent., had an uninterrupted recovery.

In the 45 cases, 42 per cent. had streptococci in the genital tract; 60 per cent. staphylococci; 18 per cent. the colon bacillus. Death resulted in 2 cases in which hemolytic streptococci were present; in

¹ British Medical Journal, February 1, 1913.

² Archiv f. Gynäkologie, 1913, Band ci, Heft 1.

³ Annali di Ostetricia, No. 7, 1913.

⁴ Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

2 in which staphylococci; and in 2 in which the colon bacillus were present.

There seemed to be no practical difference in the character of the germ as regards mortality.

Of those cases in which bacteria were found repeatedly in the blood, 3 died—one recovered after a long and severe illness, and two recovered quickly.

So far as treatment is concerned, the bacteriological examination in cases of abortion with fever gives no information of practical value. In some severe cases, only the harmless bacteria are found in the secretion of the uterus, although death may result; while on the other hand, hemolytic streptococci in pure culture were obtained from other cases which recovered without incident. In cases in which we can be certain that the substance of the uterus and its veins and lymphatics and the vessels in its immediate vicinity surrounding them, have not been involved, the prognosis is good; but if infection has spread to the tissues already mentioned, the prognosis is bad.

In treatment, the most important consideration is, if possible, to disinfect the uterus before bacteria have penetrated the uterine muscle and its vessels and lymphatics; so the uterus should be emptied of decomposing material as soon as possible.

Benthin,¹ in 30 cases of abortion complicated with fever, had a mortality of 26.6 per cent.; 30 per cent. of these were criminal cases; 13 per cent. arose from the improper use of the tampon. In 12 cases, hemolytic streptococci were found, with a mortality of 50 per cent. In 6 cases, hemolytic staphylococci, with 2 deaths, or 33.33 per cent.

Profuse hemorrhage was an unfavorable factor. Those cases treated conservatively—23 in number—had a mortality of 17.4 per cent. The bad permanent results of abortion are seen in the fact that of 10 patients whose cases he followed, but 4 were free from permanent injury.

The *prognosis* depends upon the character and situation of the infectious process. Peritonitis, thrombophlebitis, and endocarditis are the most fatal varieties. Salpingitis also increases the mortality rate considerably. Parametritis is a favorable condition, as indicating the power of resistance on the part of the patient. Cases in which, through criminal interference or the passage of bacteria from the endometrium, the uterine wall is involved, are also dangerous. Before the uterus is interfered with, a careful examination should be made, and hemorrhage should not usually be an indication for operation.

The highest morbidity and mortality are caused by hemolytic streptococci, and this is sometimes independent of the presence of fever. It is especially important that interference should be limited as much as possible in cases where virulent bacteria are present. Thus, with active

¹ Monatsschrift f. Geburtshilfe und Gynäkologie, 1914, Band xxxix, Heft 2.

treatment, the morbidity was 56 per cent., the mortality 41 per cent.; but with expectant treatment, the morbidity was 27 per cent. to 28 per cent., with no per cent. mortality.

Among those patients treated conservatively, 85 per cent. remained free from permanent injury afterward, while, among those who had active treatment, but 83 per cent. recovered. There was also a larger percentage of those who again became pregnant among the patients in whom active interference was practised.

Preventive inoculation is not dangerous, is readily done, and is feasible in private practice. In some cases, it seems to do good.

The *conservative treatment* consists in absolute rest without disturbance, the use of preparations of ergot, the application of an ice-bag over the uterus, and special care to secure an abundance of proper food. If it is necessary to remove debris from the uterus, it should, if possible, be done by the finger and with special care that no violence is caused by dilatation.

Polak¹ gives the results of 20 cases of *infection complicating abortion*. A bacteriological examination was made, and a differential diagnosis, so far as possible. Vaccines were employed, and no interference with the interior of the uterus was practised. Ergotin, pituitrin, and the application of the ice-bag, were also used.

The Production of Abortion and Sterilization of the Tubes. Hofmann² describes the method employed in the Bern clinic, as follows:

The abdomen is opened, the uterus brought forward, and the anterior wall made as tense as possible. The uterus is opened sufficiently far to permit the ready removal of the ovum, and the uterus is curetted to remove the decidua, and closed with three rows of catgut stitches. The tubes are then removed, and the abdominal wound closed.

At the beginning of the operation, 1 c.c. of secacornin and pituitrin are injected into the muscles.

The Treatment of Abortion Complicated by Fever. The statistics of 200 cases of abortion complicated by fever have been studied by Ben-thin.³ His paper is illustrated by the detailed reports of cases, temperature curves and tables, and is an interesting and thorough study of the subject. His experience leads him to believe that preventive inoculation with vaccines is useless in these cases. Unquestionably, the presence of hemolytic streptococci, in a case of abortion with fever, makes the case more serious. Criminal abortion, and cases in which manipulation has been freely practised, give a much more unfavorable prognosis than those that have not been so treated.

Clinically, there is a decided difference in cases having streptococci without hemolysis and those having streptococci with hemolysis.

¹ Zentralblatt f. Gynäkologie, No. 39, 1913.

² Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxv, Heft 2.

³ Ibid., Band lxxiii, Heft 3.

The first have little or no fever, and usually recover without complications, while the latter, although the uterus may be emptied of infective material, develop long-continued and complicated septic processes. It is also true that bacteria, which often produce little or no reaction, such as the non-hemolytic staphylococci, may become active after abortion.

Experience shows that, so far as treatment is concerned, even in cases infected by hemolytic streptococci, treatment without interference with the genital tract gives better results than more active methods. This is thought to be true of all cases of abortion complicated by fever. In cases in which hemolytic streptococci are not present, irrigation or curetting seems to do little harm, so that the policy of non-interference is best for cases infected by hemolytic streptococci; 77 per cent. of his cases had fever on the second day after admission, which seemed to him to indicate that the retention of the ovum or its portions is not a dangerous circumstance. If this be true, then the necessity for active interference is obviously present.

He believes that retained portions of the ovum do not further the development of infection. In fatal cases, he does not believe that the result can be ascribed to the undisturbed progress of the abortion. In many of these cases, the fatal infection has arisen at the time, or preceding, the abortion, often through criminal interference. He agrees with Sachs, who would divide abortion into those complicated and those uncomplicated, considering abortion itself as not predisposing to infection. Two-thirds of his cases proceeded spontaneously without assistance. This would indicate that dilatation and curetting or irrigation may often be done too hastily. The more time that elapses between the abortion and the artificial emptying of the uterus, the less is the general reaction of the patient. He has repeatedly seen the elimination of hemolytic streptococci from the secretions spontaneously. When, however, these germs persist, the principle of non-interference may be abandoned and the patient treated actively. The permanent results in these cases are better the longer the time elapsing between the abortion and active interference. This probably results from the fact that the infective bacteria grow less virulent or that the organism becomes accustomed to them and resists them more. As time goes on, the uterus becomes better involuted and the zone of protecting granulations in the lining of the uterus becomes better developed. So long as the abortion remains incomplete, bacteria readily find their way into the blood channels. When cases are treated conservatively, this is reduced to a minimum, and the organism is enabled to destroy bacteria as fast as they are produced. It is observed that, in cases so treated, it is very rare to find bacteria in the blood of the patient.

Too much reliance must not be placed upon the presence of bacteria, nor the variety, in making the prognosis. In some cases, after a prolonged period of inactivity, bacteria are produced and absorbed freely.

and the daily presence of bacteria in the blood after the abortion is practically over is a symptom of importance, as, ordinarily, by the second day after the abortion, bacteria disappear from the blood.

This constant presence of germs is usually to be ascribed to a focus outside the genital tract, such as thrombophlebitis or endocarditis. This makes the prognosis doubtful, and the longer the streptococci remain, the more grave becomes the prognosis. The continued presence and increase of streptococci often develop shortly before death, and are a symptom of great significance.

Under the expectant treatment, the duration of a case may considerably exceed the average. Complications, however, seldom develop in these cases. Prophylactic inoculation offers no especial difficulties, but its value is not proved.

It is of the utmost importance in carrying out expectant treatment that the patient be at absolute rest, and that she be protected from all disturbing influences. Substances which produce uterine contractions should be omitted in these cases. In some cases, it seems as if substances which cause the uterus to contract, prevent the passage of bacteria into the blood.

The application of cold to the abdomen by the ice-bag is to be commended. The use of the tampon is dangerous and should be avoided.

Of special importance is the diet of the patient.

Profuse hemorrhage is rare in these cases. It is an indication for interference, which should be done as promptly as possible. Those patients seen during, or immediately after, the abortion are dangerous subjects for operation, because sufficient time has not elapsed for the formation of the zone of protection.

He would also practice conservatism in cases in which there was doubt concerning the retention of a portion of the placenta. Even this, which is usually considered of grave moment, should not hasten interference. If possible, the operator should wait until hemolytic streptococci have vanished before interfering.

In treating these cases, he did not vary the treatment in accordance with the variety of the bacteria present. All cases were treated conservatively.

His observations lead him to believe that the expectant treatment can be carried out in complicated cases. If symptoms of peritonitis develop, then operation, which seems indicated from the local conditions, should be performed. When the pelvic veins become thrombosed, he does not believe it logical to operate upon them. Such cases coming under his observation recovered without operation, although bacteria were present in the blood for a long time.

Traugott¹ contributes a paper giving *the results of active and conserva-*

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxv, Heft 2.

tive treatment of abortion complicated by the presence of streptococci. In 40 cases, 22 of whom had fever on admission to the hospital, and 18 without fever, the patients were treated by absolute rest, the application of ice to the abdomen, and no interference was practised. The average duration of the fever was 3.7 days, and the average duration of fever after the emptying of the uterus by artificial means was about one-fourth of a day. Previous to the artificial emptying of the uterus, the patients were ill on the average 13.5 days, and four days afterward.

All of the 40 patients recovered without complications. The principle of treatment was the surgical principle of not interfering with the interior of the uterus while in a condition of acute infection. It was thought wise to wait until the bacteria had become less virulent, when the debris of the ovum could be removed with safety.

Two hundred and thirty-seven cases of abortion complicated by the presence of streptococci were also under observation; 99 of these were treated by the artificial emptying of the uterus, with an average duration of illness of twenty-four days; 138 were treated without interference, with an average illness of 13.4 days.

Among the 138 cases, the fetus and placenta were spontaneously expelled in 48, the entire placenta in 13, and remnants of placenta in 42; nothing came away in 35.

He does not believe that the retention of portions of the ovum is in itself a dangerous circumstance.

Ebeler¹ reports the results of treatment of 641 cases of abortion, 148 of whom had fever in varying degrees. Cases of threatened abortion were treated conservatively by rest, the use of an ice-bag, and narcotics to subdue pain. Special care was taken to avoid infection, and the bladder and rectum were emptied. When bleeding and pain had ceased, the patients were allowed to get up. When abortion had actually occurred, or was in progress, the case was treated actively, unless infection had developed to the point of attacking the tissues about the uterus. No clinical importance was placed upon the bacteriological examination of material obtained from the vagina and cervix. The method employed was the dilatation of the cervix sufficiently to admit the gloved finger, or a broad, blunt-edged curette. Hegar's solid metal dilators were employed, if needed. In the first month of pregnancy, when the indications were not urgent, dilatation was secured by a laminaria tent. In no case did salpingitis develop.

His method of procedure consisted in grasping the cervix with tenaculum forceps, introducing a self-retaining speculum, and exploring the cavity of the uterus thoroughly with the finger. If the material came away readily, no further instrument was used, but, if it did not, the blunt curette was employed. The uterus was then irrigated and

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxv, Heft 2.

packed with gauze. When the pregnancy had proceeded to the development of the placenta, interference was not practised so actively, but conservative treatment was employed. The results were that, in 42 cases of threatened abortion, all were successfully prevented, the patients going on in pregnancy. Seven cases of therapeutic abortion recovered from the operation; 43 cases had endometritis after abortion and were treated by dilatation of the cervix with a laminaria tent and curetting; 42 of these had no reaction; one developed fever and a tumor in the left tube, which disappeared after two weeks; in 85 cases that had no fever, 83 patients passed through an absolutely normal recovery; 2 had fever during the period of convalescence.

Among the cases of abortion without fever, numbering in all 493, there was no death. Of these, 316 were incomplete abortions, treated by the method already described, and 290 of them had no fever during convalescence and made a speedy recovery. The rest had varying complications during the period of recovery, but there was no mortality.

Of the 148 treated by the method described, 111 had fever after the treatment. In a considerable proportion of these, the temperature speedily dropped to normal. In others the fever persisted for some time, with various complications.

The mortality among these cases was 4.9 per cent., which contrasts favorably with other reports of a similar nature. He believes that the digital emptying of the uterus in abortion, whether the patient has fever, or does not have fever, is clearly indicated, and that it is essentially a conservative method of treatment.

A Lessened Birth Rate and its Relation to Artificial Abortion and Sterilization. Fehling¹ calls attention to the fact that, owing to the strain of modern life many parturient women must have artificial abortion produced because of some disease which makes the continuation of pregnancy impossible. These results materially assist in lessening the birth rate in the hope of saving the life of the mother at the expense of the ovum.

Criminal Abortion In Ectopic Pregnancy. Turrenne² reports the interesting case of a patient who introduced a sound into the uterus and made an intra-uterine injection to bring on abortion. She suffered great pain from this interference. A watery fluid was discharged from the vagina and pain continued for several days, with the discharge of clots and of bright-red blood. The pain was bilateral, but slightly greater upon the right side. The pain gradually became more severe and was accompanied by considerable shock. She was examined a month after the introduction of the sound and colostrum was found present in the breasts, the abdomen relaxed, sensitive to pressure, the cervix softened, and the body of the uterus somewhat enlarged. The uterus was retro-

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiv, Heft 1.

² Archiv. mens. l'Obstétrique, October, 1913.

verted and painful upon motion. The right tube could be made out as enlarged, painful, and upon the right side of the cul-de-sac. The tube had increased considerably in size since the first examination six days previously. There was no sign of pelvic hematoma.

A diagnosis of tubal pregnancy was made, which was confirmed by operation. The right tube and ovary were removed.

Efforts to Produce Abortion through a Mistaken Diagnosis of Pregnancy, and their Result. Liebecke¹ has collected 44 cases in which women, supposing themselves to be pregnant, had efforts made to produce abortion. The methods employed consisted in the introduction of sounds and various objects into the uterus, and injections of different materials. A very considerable mortality and morbidity resulted from septic infection or from the entrance of fluid into the bloodvessels.

Unquestionably, this interference is practised more commonly than is generally supposed. In the writer's experience a young woman, married, was taken by her mother to a criminal abortionist because disturbances of menstruation had given rise to a suspicion of pregnancy, which was not desired. The abortionist introduced some object, probably a sound, within the uterus with sufficient violence to cause considerable hemorrhage. As the hemorrhage persisted, the patient was put under the care of reputable physicians at her home, a history of incomplete abortion was given, and by these physicians dilatation and curetting was practised. Shortly after, she became violently ill with infection, when a change in her medical attendants was made, and a consulting staff summoned. Examination of the blood showed hemolytic streptococci, and the patient died of virulent sepsis. No evidence whatever that she had been pregnant was discovered.

OBSTETRIC SURGERY.

A return to one of the dangerous and unfortunate uses of the *forceps*, which has been abandoned by the majority of obstetricians, appears in a paper by Neuwirth²—The Intra-uterine Application of the Forceps through a Partly Dilated Cervix.

The writer describes a former practice in cases in which the head presented, but dilatation was partially complete, and the necessity for delivery through the vagina seemed imperative. This consisted in incising the cervix, applying clamps to the edges of the cervical wound to check hemorrhage, introducing the forceps, and delivering the child, then closing the lacerations by immediate suture.

He describes a fatal case, in which death occurred from hemorrhage, as an instance of the danger of this procedure.

¹ Monatschrift f. Geburtshülfe und Gynäkologie, 1913, Band xxxvii, Heft 6.

² Zentralblatt f. Gynäkologie, No. 37, 1913; No. 41, 1913; No. 45, 1913; and No. 10, 1914.

To obviate this, he has devised a pair of forceps much resembling Simpson's, which he introduces within the uterus through a partly dilated cervix, grasping the head above the brim of the pelvis, so that only the external portion of the handles of the forceps remain outside the vagina. He admits the difficulty in introducing the instrument, and especially the right blade. Having introduced the blades, he cautiously tries to close them, endeavoring to grasp the sides of the head, the forceps usually standing obliquely or transversely. Using the forceps to make gentle traction and to dilate the cervix, he tests the elasticity of the cervix by bringing the head down.

In his experience, from six to ten tractions have been sufficient to complete dilatation and convert the case into ordinary high-forceps application.

For this operation he requires a long, light, and slender instrument without a pronounced pelvic curve, with the English type of lock and handle.

In his original paper, he reports three cases in which Bandl's ring was plainly evident and intra-uterine rupture threatened; where the children were delivered without especial injury, and mothers and children recovered.

This revival of the old custom of applying the forceps to the so-called floating head, practised fifty years ago by some Continental obstetricians, brought to this country and exemplified in the use of Hodges' forceps, has long since been abandoned by modern obstetricians.

The most valuable and important clinical test of the relative size of fetus and pelvis, is found in the engagement of the fetal head. No other method for such measurement compares with this in value and reliability. When the forceps is applied to the floating head this test is disregarded, and traction is made upon the head not molded, and disproportionate to the mother's pelvis. Molding establishes the proportion necessary for successful birth. Experience shows that the bringing of the fetal head through a partly dilated cervix results in lacerations, whose extent and severity cannot be foretold, and which often extend so high as to open the pelvic tissues and give rise to hemorrhage which is practically uncontrollable.

It is interesting to observe that the author of this proposition states that he has never employed it in hospital practice, but that he has had 3 cases only, and those in private houses. He gives no evidence that he has hospital facilities at his disposal, or that he has had hospital training.

In the *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1914, Band xxxix, Heft 1, August Martin reviews the history of the forceps, its invention and use, and calls attention to Johnstone's proposal at the Rotunda Hospital, in Dublin, to apply the forceps through a partly dilated cervix within the uterus. The results of this experiment were

so bad, and the criticisms so trenchant, that Johnstone himself abandoned the practice and condemned it as unsafe.

Martin calls attention to hemorrhage, extensive lacerations, and the results of these injuries, as the inevitable final result of such a misuse of the forceps. He states most emphatically that dilatation of the cervix is absolutely indispensable before the forceps can be safely used.

In the discussion which followed the reading of Newirth's original paper at the Obstetrical Society in Vienna, his proposal found no support. Sellheim, Hofmeier and Herzfeld wrote strongly condemning it. No defender could be found for this proposal among the German and Austrian profession.

The belief still lingers in the minds of some practitioners that if only the forceps can be applied to the head, the child can be delivered independently of engagement or dilatation of the cervix. Within the past ten years, at the Maternity Department of the Jefferson Hospital, cases have been admitted where this effort had been made by the practitioner and attendants. Laceration of the uterus extending high above the cervix and practically opening into the abdominal cavity, the bruising of the child's head so severely as to destroy the sight in one eye, breaking the forceps, leaving a portion of one blade within the uterus, and laceration, hemorrhage and infection, have been the results of this effort. It is to be hoped that Martin's and Sellheim's condemnation, and the good sense of the profession, will prevent a repetition of these disasters.

Jointed Obstetric Forceps. Doran¹ reviews the history of the jointed obstetric forceps.

The instrument was first supplied with jointed handles for convenience in packing, and Freake, surgeon to St. Bartholomew Hospital, seems to have been the first who devised this instrument. When the forceps were invented, they were jointed for the purpose of allowing blades of different sizes to be fitted on the same handles. Pajot constructed such an instrument, having the special device known as Pean's aseptic joint. This instrument has been very popular in France. The forceps was also made jointed to make it asymmetrical for difficult applications to the head. This was first done by Carof, of Brest. Another jointed forceps was that of Campbell, of Paris, where the handles were fitted with a slide so that they might be made long or short. Bing, of Copenhagen, invented a jointed forceps which could be applied to the fetal head, and with long handles subsequently attached. Conquest, of London, obstetric physician to the London Lying-in Hospital, devised a forceps without a pelvic curve, with solid blades having little cephalic curvature, and jointed in one of the handles to permit the application of the instrument without turning the patient upon her back

¹ Journal of Obstetrics and Gynecology of the British Empire, October, 1913.

and when traction must be made with the patient in an unfavorable position. Other jointed forceps were devised by Hamilton, of Edinburgh, and his son. David Davis invented several patterns of obstetric forceps, longer than the average, jointed in one blade, the long one covered with leather and padded with flannel, so that, as the forceps was applied over the face, it might injure the child as little as possible.

These instruments were all used before the head had completely molded, descended, or begun to rotate, and have long been relegated to museums. Several of them were on exhibition at the International Congress of Medicine in London, August, 1913. Aside from their historic interest, they serve to explain the injuries which mother and child often receive during forceps delivery. No wonder that the forceps operation in those days was one of the most dangerous and bloody of surgery.

Three Cases of Transverse Position of the Head at the Pelvic Brim. Nacke¹ describes the case of a multipara with excessive amniotic liquid, where the head, which was exceedingly hard, became wedged into the pelvic brim in transverse position, with the occiput beginning to turn posteriorly. Nineteen hours after the rupture of the membranes, perforation was performed, followed by delivery with the cranioclast.

Upon examining the head, its bones were unusually firm and hard, and the occiput abnormally shaped and abnormally projecting. There was no hydrocephalus, nor was there other abnormality in the child.

It is hard to understand in this case the performance of craniotomy upon the living child, when, by section, the child could have been given a chance for its life without undue risk to the mother.

His second case was that of a primipara, aged thirty years, in which the head turned across the brim of the pelvis, and where pituitrin failed, although given twice, to secure the descent of the head. The pelvis was considerably contracted transversely. Tarnier's forceps delivered a living child, with the recovery of the mother.

His third case was that of a posterior position of the occiput in a multipara, aged thirty years, the head partially engaged, the pelvis moderately contracted, and a contraction ring forming in the uterus. The contraction ring was present and meconium was escaping from the vagina, but the fetal heart sounds were good. The forceps was applied in the transverse diameter and a sagittal suture brought into one of the oblique diameters. The occiput had rotated posteriorly. Extraction was very difficult, for the child was very large; but mother and child recovered.

Enlargement of the Pelvis by Resection of the Promontory. In the *Zentralblatt für Gynäkologie*, 1913, No. 41 and No. 48, Rother, of Budapest, became convinced, by dissection and experiment upon animals,

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

that the pelvis could be enlarged by resection of the promontory. By this means he secured an increase of from $1\frac{1}{2}$ to 2 cm. He reports 9 cases in all—4 in the Frauen-clinic in Budapest, and 5 in the clinic in Prague.

He describes the case of a multipara, aged thirty-two years, who had lost children through birth pressure. Her pelvis was a justominor, with true conjugate of 7.8 cm.

The patient was placed in the Trendelenburg posture and the abdomen opened in the median line from the symphysis to the umbilicus. The intestines were carried up toward the diaphragm, and the descending colon pushed toward the left. The promontory of the sacrum was easily available, and the parietal peritoneum was separated from 6 to 7 cm., the subperitoneal fat, and the membrane separated from the bone by gauze compresses. The sacral arteries were ligated above the promontory. The bony tissue at the promontory was then removed with a specially constructed concave thin knife 4 cm. in width, very sharp, and the edges of the connective tissue and peritoneum brought together with two catgut stitches over the point of resection.

The operation proceeded smoothly, the patient making an uninterrupted recovery. Bleeding from the bony tissue was very slight and ceased promptly. The patient left the hospital on the seventeenth day, and five months after the operation, on examination no callus was present, the tissue was smooth and flat where the promontory had been, and the diagonal conjugate, which before operation was 9.3 cm., was increased to 10.7 cm.

In his 8 other cases, the operation was done in 7 as an alternative to Cesarean section. Of these, one patient died of peritonitis, which had no connection with the resection of the bony tissue. In one patient the operation was performed at the fourth month of her third pregnancy. Labor was terminated through the vagina successfully, but with assistance. The fetus was in transverse position and the cord prolapsed, which necessitated version and extraction. The passage of the aftercoming head was remarkably easy.

Obstetric Antisepsis. A contribution to obstetric antisepsis is made by Bondy.¹ He has observed the bacteriological properties of *mesothorium*. In one of his experiments, he used 30 milligrams of mesothorium in a tube 12 mm. long and 2 wide, covered with silver $\frac{2}{100}$ mm. thick.

In other experiments the mesothorium was in a flat metallic capsule which contained 15 mg., the capsule being 1 cm. in diameter. The experiments were made upon the *Bacillus prodigiosus* and *Staphylococcus pyogenes aureus*, with streptococci in bouillon cultures and tetanus bacilli.

¹ Zentralblatt f. Gynakologie, No. 31, 1913.

The *Bacillus prodigiosus* was put upon an agar plate and exposed to the action of mesothorium for twenty-four hours. The growth of the bacteria seemed to have been arrested by the mesothorium in the tube. When a similar experiment was tried with mesothorium in the metallic capsule, although the quantity was less than that in the tube, the effect was more pronounced.

The results with the staphylococcus were similar, but the effect was less pronounced. When a leaden capsule 3 mm. thick, inclosing a tube of mesothorium was used, no effect whatever was produced.

Should radium or mesothorium be found practically efficient in producing antiseptis before operation, they might be used upon neglected and mismanaged cases where injury and infection of the cervix had already developed. Should these injured and infected tissues be rendered sterile, the results of abdominal section in such cases might be considerably improved.

Symphysiotomy and Pubiotomy. Kehrer¹ contributes an interesting paper upon subcutaneous symphysiotomy by Frank's method. He traces the history of subcutaneous symphysiotomy from the Spanish obstetrician, Delgado, to the development of Stöckel's and Zweifel's operations.

Frank opens the symphysis through the middle of a skin incision above the symphysis, which enables him to perform the operation subcutaneously. The technique of the operation he describes as follows:

Anesthesia may be produced by ether, chloroform, or sacral injection. After the vulva has been disinfected, two fingers of the left hand are introduced within the vagina and brought upon the posterior surface of the symphysis, the height and thickness of which are determined, and the urethra carried to one side. An assistant with a pledget of gauze pushes the tissues above the clitoris with the left hand as far down as possible, so that the urethra and clitoris are brought to the inferior border of the symphysis. An incision is then made directly upon the middle of the symphysis through the skin, which is brought tense, and the knife is carried through the under half of the symphysis to the ligamentum arcuatum, and then, without removal from the wound, the upper half of the symphysis is severed. A smaller probe-pointed knife is then employed to separate the tendinous attachments which hold the pubis together. The symphysis then separates about 2 cm., and the ligamentum arcuatum is severed, when both lower extremities of the patient which have previously been abducted and rotated outward are now adducted and rotated inward, to prevent further injury to the tissues. The final separation of the symphysis is from 2 to 3 cm., and more is unnecessary as it may result in injury to the sacro-iliac joints. The knife is then removed and the wound tamponed with

¹ Archiv f. Gynäkologie, 1913, Band xcix, Heft 2.

gauze. The cutaneous wound is closed, powdered with vioform, and covered with gauze. A test is then made with the catheter, to be sure that the bladder is uninjured. The patient is placed in bed and given pituitrin or pitoglandol, with the hope that spontaneous birth will occur. The upper portion of the patient's body is slightly raised, the knees being separated only sufficiently to permit manipulation, and the legs and thighs are somewhat bent. After the placenta has been delivered, a permanent catheter is put in the bladder for several days.

Kehrer reports in detail 10 cases, and reviews his own results and those of Frank. His experience leads him to believe that the operation is a favorable one, and that its mortality— $\frac{8}{10}$ of 1 per cent.—contrasts favorably with the mortality of hebostiotomy, 4.1 per cent., in 217 cases. In 79 multiparous women, all of the children were saved.

The operation commends itself because of its simplicity, the small incision through the skin, the avoidance of injuries to the bladder, vulva, urethra, peritoneum and the tissues between the bladder and the uterus, if the original technique devised by Frank is carefully followed. In 60 per cent. of cases, the corpus cavernosum of the clitoris was injured, followed by hematoma; and in 30 per cent. of cases from this developed thrombophlebitis of one or both of the lower extremities, which complicated the puerperal period and delayed convalescence. In 118 subcutaneous symphysiotomies, this did not occur.

The operation should be limited to multiparae, and is not applicable for primiparae because of the danger of lacerations of the vagina opening into the pelvic tissues, and injuries to the child.

Operative delivery, after this operation, should be avoided if possible, and resorted to only in exceptional cases.

A great advantage of the operation lies in the fact that when the disproportion between the pelvis and fetal head is not too great, and when pituitrin, Walcher's position, and efforts to press the head into the pelvis have not proved successful, spontaneous labor may often be procured before symptoms of uterine rupture become pronounced, by this operation. The effects of pituitrin after the operation are remarkable, and the drug is usually efficient. Uterine inertia is no contra-indication.

The field of operation embraces justominoir, flat, rachitic and generally contracted pelvis, with a true conjugate from 6.9 cm. to 6.8 cm. as the lowest limit.

Injury to the sacro-iliac joints will not result unless the symphysis separates at operation considerably more than 3 cm.

The operation is indicated in presentations of the parietal bone, either anterior or posterior, abnormal positions of the presenting part, brow presentations, prolapse of the cord, and other abnormalities.

The operation should be avoided in infected cases because of the danger of thrombosis following hematoma. In such, extraperitoneal section,

or perforation of the living child, should be selected. The patient's ability to walk is not interfered with by the operation, and patients who have been delivered in this manner have been able to do arduous work, and to dance and take other exercise without difficulty. The bony tissues heal after this operation, as do any wounds in the bones.

After hebostiotomy, the symphysis usually unites upon a callus, resulting in a more or less ligamentous union; while after subcutaneous symphysiotomy the bony union is usually observed. Considerable pelvic enlargement follows the operation. No injury to the vagina, and no laceration of the levator muscle was observed.

The only objection to the operation which experience has shown, is the tendency to the formation of hematoma, with possible thrombophlebitis afterward.

Kriwsky¹ describes the case of a patient, aged twenty-four years, admitted to the hospital in labor, with partial dilatation but with a thickened condition of the cervix. The patient stated that the amniotic liquid had escaped. Pains had been going on for twenty-four hours. A previous labor had been terminated with difficulty by the use of forceps.

Upon examination the pelvis was rachitic, the external conjugate 19 cm., the internal conjugate 10 cm., and the head movable above the pelvic brim. The pains continued during the day, but the head did not engage in the pelvis. Forty-four hours after the beginning of labor, the patient was becoming exhausted. Pubiotomy was performed by Döderlein's method, the incision being made through the skin parallel to the left pubic bone and the skin was pulled strongly downward. The finger was placed in the wound and plainly detected the rachitic pubic tubercle. The periosteum was easily separated, the needle passed around the bone, and, under the guidance of the finger, brought out in the left labium. The bone was severed with Gigli's saw, and the free hemorrhage following was stopped by pressure. The ends of the bone separated one and one-half fingers' width. Simpson's forceps was then applied in the left oblique diameter, and a well-developed female child, slightly asphyxiated, was delivered, and quickly revived. The placenta was expressed, a drain put in the lower punctured wound, serrephines employed to close the upper wound, and a firm bandage applied.

Immediately following the operation, the temperature was subnormal, on the second day between 99° and 100° F., and the uterus tightly contracted, not sensitive, but high in the abdomen. The bandage was removed and the tampon from the incision, when fluid blood escaped from the wound.

The left labium was edematous. The temperature rose, and an erysipelatous redness developed in the left inguinal region and upper por-

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1913, Band xxxvii, Heft 4.

tion of the thigh. Two days later the temperature fell, but from the upper wound there was a profuse bloody and exceedingly offensive discharge. Sixteen days after the operation two counter-openings were made in the left inguinal region, rubber drainage tubes passed, and the phlegmonous process did not extend lower than the bones of the pelvis.

On the thirty-second day after operation, a bony callus could be detected, without inflammatory infiltration.

The patient left her bed fifty days after the operation and was able to move the left leg without pain. Upon palpating the pelvis, it was found that the severed bones were movable. While there was a considerable callus, it was not complete at the lower portion. The pelvic organs were in normal condition. An x-ray picture of the pelvis showed clearly the line of section made by the saw, and demonstrated that complete union had not resulted. Although the patient was able to walk, there was pain in the left upper thigh, probably because of the erysipelatos infection.

In reviewing the case, the indications for operation seemed clear, the choice lying between craniotomy and hebostiotomy.

The writer compares hebostiotomy with other methods of delivery in similar cases, and quotes the statistics of various operators. He also quotes two cases, in one of which hebostiotomy was performed twice—once upon the left, and once upon the right side—the union in each case never becoming perfectly firm. There was considerable callus, and the size of the pelvis was not greatly enlarged.

When a third pregnancy occurred, the patient elected Cesarean section and requested sterilization; but, upon delivering the child, it was found to have a meningocele in the lumbar region which was afterward successfully operated upon.

In view of the uncertainty of the life of the child, sterilization was not performed, but the uterus was retained, the mother making a good recovery.

The writer quotes from various operators, giving 28 cases in which hebostiotomy had been done, with subsequently 33 spontaneous births. Also a series of 12 repeated hebostiotomies, with 5 of the cases subsequently treated by section.

Another collection of 76 cases showed spontaneous birth with 26 repeated hebostiotomies, 1 symphysiotomy, and 15 Cesarean sections. These cases would indicate that hebostiotomy does not necessarily mean that in a subsequent pregnancy the patient must be treated by the same method.

The writer urges that this operation is no panacea for all cases of contracted pelvis, but that it has a definite place in the treatment of this complication. He believes it to be clearly indicated in multiparæ with slight pelvic contraction. In primiparæ the undilated condition of the birth canal makes serious wounds and lacerations, which are

inevitable during delivery after hebstiotomy. He prefers Döderlein's method of terminating labor by forceps or version. In the after-treatment, he turns the patient upon her side as soon as possible.

He recognizes the fact that union takes place very slowly between the cut ends of the bone and that often a bony union fails, and connective tissue only is developed. He has rarely seen permanent enlargement of the pelvis of sufficient extent to be of practical value.

Wesenberg¹ exhibited, before the Gynecological Society of Hanover, a pelvis from a patient upon whom he had performed pubiotomy two and a half years previously. After the operation the patient gave birth to a well-developed child, and made a normal recovery with good power of motion.

Two years later she had also a spontaneous labor, when it was found that the true conjugate had increased 0.5 cm. In a subsequent labor, the uterine contractions were deficient, the uterus ruptured spontaneously, and the patient died.

Upon examining the pelvis, the site of the cut made by the saw could be plainly distinguished 1 cm. wide. There was no bony union. The periosteum had become thickened and there was considerable scar tissue. Some of the pelvic diameters were somewhat enlarged.

Wesenberg has performed 28 pubiotomies, in 3 complicated by lacerations of the vagina, which communicated with the bony wound. These healed without complications. All of the mothers recovered; 26 of the children were born living; 2 were stillborn. In these cases it was thought that the operation was done too early, before the cervix was properly dilated, and while uterine contractions had not fully developed. In 1 case, there was suppuration in a hematoma which formed in the vulva, and excessive callus formed in the pelvis, which so lessened its capacity that in a later pregnancy Cesarean section was substituted. It was observed that the pelvis was somewhat enlarged after pubiotomy, and it was also found that the operation could be performed in the presence of high fever without bad results. In the case which died from rupture of the uterus, the uterine contractions were feeble, the cervix was not dilated, and there were no warning symptoms of uterine rupture.

Rüder² reports 15 hebstiotomies in the Eppendorfer clinic. Of these patients, 11 were multiparæ and 4 primiparæ; 9 were suspected of possible infection. In 5 cases, large hematomata formed, in 2 cases there were lacerations of the vagina communicating with the bony wound, and in 2 cases wounds of the bladder and urethra. The puerperal period lasted from twenty to seventy-three days.

Of the 15 patients but 4 escaped fever; 6 were subnormal in temperature, and 6 had high fever. Three children died, and one mother on the

¹ *Monatsschrift f. Geburtshülfe und Gynäkologie*, 1913, Band xxxvii, Heft 5.

² *Zentralblatt f. Gynäkologie*, No. 4, 1914.

fifth day after operation from a lesion of the heart. During the puerperal period 2 cases suffered from thrombosis, 1 from pneumonia, 1 from pyelitis. Four of these patients had five labors after operation, of which four were spontaneous, and one was a repeated hebostiotomy.

The death of one child resulted from an enormous hematoma which formed in the birth canal, preventing delivery; and in 2 cases from disproportion between the head and the birth canal which was not overcome by the operation.

The writer considers acute infection, primiparity, varicose veins, and highly contracted pelvis, as contra-indicating the operation.

In discussion, Roth gave the results in the Dresden clinic in 85 hebostiotomies, as two maternal deaths and seven fetal deaths; 10 cases of lacerations opening the vagina as far as the operation wound; 12 cases of thrombosis. In 38 women whose histories had been followed, 10 had severe pain in the sacro-iliac joints afterward. In 1 case dying of septic infection, pus was found in the sacro-iliac joints. Cystocele and prolapse had frequently been observed after the operation, and 6 patients had the pelvis made considerably smaller by the excessive development of callus. Selligmann stated that the mortality of the operation in Vienna was 2.5 per cent., which he considered a very considerable death rate.

A Fatal Case of Puerperal Infection Following the Use of Tampons to Check Hemorrhage. Dougal¹ reports the case of a patient in the eighth month of pregnancy, admitted to hospital with a history of two weeks' bleeding, which had been treated by her family doctor by vaginal tampons. The pulse and temperature were normal, but the patient had lost considerable blood.

Upon examination the vagina was found packed with several tampons which had evidently been in place for some time, and upon removal were found to be extremely offensive. The vagina was carefully swabbed out with an antiseptic.

No placenta could be found on examination and the hemorrhage had evidently come from the partial separation of a normally implanted placenta. Spontaneous labor developed about thirty hours after admission. The child was premature and stillborn, macerated and shrivelled, with an exceedingly foul odor. The placenta and membranes were offensive, and there was hemorrhage during their delivery, when it was noticed that the blood contained bubbles of gas. Shortly after delivery the patient had a chill, her temperature rose to 101° F., and her pulse to 140. Virulent septic infection speedily developed, with collapse and cyanosis, blood-stained urine, icterus, and a large patch of purplish discoloration on the right side of the chest. The patient suffered great pain, and the skin became greatly discolored. Death occurred half an

¹ Journal of Obstetrics and Gynecology of the British Empire, January, 1911.

hour after the attack, and but eighteen hours after the termination of labor.

At autopsy, bubbles of gas escaped from the subcutaneous tissues, from the veins, and from the cavity of the body. The peritoneal cavity was filled with offensive gas. Enormous numbers of large bacilli were found in the tissues which were identified as the *Bacillus aërogenes capsulatus*. The same organism was found in the tissues of the child. This bacillus is frequently present upon the perineum and in the rectum, and is not pathogenic for healthy animals under normal conditions.

The hemorrhage from which the patient suffered had greatly reduced her power of resistance, and the tampon had been the agent through which the infection had occurred.

The Use of the Dilating Bag in Labor, Complicated by Fibroid Tumors. Christiani¹ reports the case of a primipara, aged thirty-seven years, with premature rupture of the membranes and prolonged labor. The midwife in attendance summoned a physician. An examination was made and a pelvic tumor was found, complicating labor. During the next twenty-four hours no progress was made, the fetal heart sounds ceased, the abdomen became distended, and the patient was considerably weakened by suffering. The pelvic tumor was scarcely movable, and prevented the descent of the head.

Under anesthesia, it was possible to dislodge it but partially, and so soon as the hand was removed, the tumor sank upon the pelvic floor. To obviate this a dilating bag was introduced and gradually distended, which brought about uterine contractions, and the head gradually descending, the tumor being forced upward. It was then found that the patient had a flat pelvis. The bag was gradually forced out by uterine contractions, craniotomy was performed, and the child delivered. The tumor remained, as large as a fetal head, and during the puerperal period caused pain by pressure at the pelvic brim.

Four months after, the patient was examined and found to be two months advanced in pregnancy. The tumor had not diminished in size, and as it threatened labor, operation was proposed, but declined. The patient's history was followed, and it was found that the pregnancy terminated in spontaneous labor without special difficulty.

The Result of Induced Labor in a Pelvis of Moderate Contraction. Pomfick² gives the results of 42 cases of contracted pelvis among 2100 labors.

Among the 42, induced labor was performed in 15. In the last five and one-half years in the clinic he has performed no Cesarean sections, except one vaginal section for eclampsia, and no hebstiotomies. None of the 15 contracted pelvises had a true conjugate of less than 9 cm., and in no case was the operation performed upon a primipara.

When patients presented themselves at the beginning of the second

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiii, Heft 2.

² Ibid.

half of pregnancy, and it was found that the true conjugate was less than 9 cm., and in just minor pelves not less than $9\frac{1}{2}$ cm., the beginning of spontaneous labor was awaited in the hope that the patient would deliver herself. When, however, it was evident by palpation that the fetal head was of unusual size and hardness, and not molding, and that uterine contractions were likely to be deficient, interference was practised.

An effort was made during pregnancy to limit the size of the child by placing the mother for six weeks upon a restricted diet. When, however, it was seen that pregnancy should not go on, the induction of labor was practised. The membranes were retained unruptured as long as possible. If the heart sounds were good, no vaginal examinations were made, but palpation was practised, and, if necessary, examination made by the rectum.

As the patient came into labor, morphin was given and care was taken to avoid pituitrin and pituglandol as highly dangerous. Of all drugs controlling pain, morphin is best. Sacral anesthesia proved unreliable.

When labor had developed so that the period of expulsion should begin, if the membranes had not ruptured they were artificially opened, and, if engagement occurred, the case was evidently a favorable one. The head was pressed into the pelvic brim by manipulation, as much as possible, and Walcher's position, the use of the birth-stool, and other methods for causing descent, were employed. When descent and engagement developed, the labor was terminated, if necessary, by the use of forceps.

Among the 15 cases were 14 primiparæ with contracted pelves; 11 of the children were born living, and 3 stillborn. In the 3 cases in which children were lost, 1 was born by the high application of forceps, and two perished through birth pressure.

Among the 14 cases, 80 per cent. of the children were discharged living and in good condition; 5 had spontaneous labor, 4 forceps, 2 version and extraction.

The time for the induction of labor was thought best at the thirty-sixth week; the method, the use of bags, except in polyhydramnios, when the membranes were ruptured. The patient was allowed to expel the bag spontaneously, and if version was done it was performed under deep anesthesia, and extraction was carried out with the patient in Walcher's position. Upon introducing the bags, no anesthetic was employed.

As a rule, pains developed within an hour or two, and the bag was spontaneously expelled in from six to ten hours.

Among the 15 cases there were 6 fetal deaths, which is a high fetal mortality. There was no maternal mortality, and but one death among the 2100 labors, which occurred after vaginal Cesarean section in eclampsia.

Extraction with Küstner's Blunt Hook. Strempel¹ describes 3 cases—2 primiparae and 1 multipara—where descent failed in breech presentation and where Küstner's hook was used to great advantage.

In the first case, a young primipara, efforts at extraction had failed, and Braun's hook had been used without success. A diagnosis of rupture of the uterus had been made and the patient brought to the hospital for delivery by section.

Upon admission she was having strong pains. Upon examination the pulseless cord was found in the pelvis, the left hip on the left side and in front, the right hip on the right side and behind. Küstner's hook was introduced into the right groin, when the breech turned in the transverse diameter. The hook was removed, and again introduced and the breech brought down. The child was large and dead, but was not wounded by the instrument.

Upon examination uterine rupture was not present, but hemorrhage had occurred from lacerations of the vagina and cervix.

In the second case, a multipara, with breech presentation, labor was slow and painful, and the hook again was used with great improvement.

In the third case the extraction was not difficult, and the child, although asphyxiated was revived.

In using the instrument, Küstner's rule must be followed, to invariably insert the hook into the posterior groin.

Postoperative Ileus. Schubert² has found that mechanical irritation of the intestine and peritoneum during operation, infection of the abdominal cavity, contact of loops of intestine with the abdominal wound and with old adhesions, and closure of the vessels of the mesentery, all predispose to the development of ileus.

He cites the case of a patient in whom this developed and in whom the abdomen was reopened in the first line of incision. The coils of intestine beneath the wound were pale, greatly distended, and the peritoneal covering of the bowel and abdominal wall contained masses of fibrin. In the pelvis was a small quantity of bloody serum, and the pelvic peritoneum was smooth and shiny. When the peritoneum had been closed by suture, there was no deposit of fibrous material and no adhesions of intestinal loops. At no point could intestinal occlusion be found.

A long rectal tube was introduced, and under the guidance of the hand in the abdomen, was carried up to the level of the left kidney. Gentle pressure with gauze was made upon the intestine and gas escaped freely through the tube. The distended bowel was then carefully replaced and the abdomen closed.

The case was one of purely paralytic ileus.

In another case, repeated and copious irrigation of the stomach

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiii, Heft 2.

² Ibid.

produced a free discharge of greenish-yellow and foul-smelling material, followed by the gradual disappearance of intestinal retention, and the recovery of the patient.

In another case, the point of obstruction seemed to be above the umbilicus, when a small area of perforation was found in the intestine high up in the abdomen. The intestine was resected, but the patient died.

In another case, perforation had occurred in the lower portion of the bowel through adhesion of the intestine with an old adherent area in the peritoneum.

That the removal of an ovarian tumor may subsequently be the cause for ileus was exemplified in the experience of the reviewer in a recent case.

In her first labor, the patient had Cesarean section because of disproportion between mother and child and failure of uterine contractions to bring about engagement. Several years afterward a second pregnancy occurred, with pronounced nausea. A physician was consulted, who found a tumor in the pelvic cavity which he thought was a retroverted uterus. This he supposed he had replaced, and applied a pessary.

Upon examination later, it was found that the patient had two tumors which resembled each other in size and consistence. One was in the pelvic cavity, the other just above the pelvic brim. It was thought that an ovarian tumor had prolapsed into the pelvis, and abdominal section was performed.

At operation, the diagnosis was proved to have been correct, and a cystic tumor of the right ovary large enough to fill the pelvis was brought up and removed. The pedicle of the tumor was broad, and a line of incision of considerable length was made in the right broad ligament. The anterior wall of the uterus had been adherent to the abdominal peritoneum so firmly that the adhesion was separated by cutting. From this operation, the patient made an uninterrupted recovery, and went on to term.

She was again delivered by section, when it was found that a loop of intestine had become adherent with the right broad ligament, so that in emptying the uterus this adhesion was partly separated and the veins in the broad ligament were opened, which bled freely. These were secured by suture, the uterus emptied, sutured, and dropped back into the abdominal cavity. The uterus was closed in the usual manner and replaced, as hysterectomy had been declined positively by the patient and her husband.

Four days after operation the patient developed symptoms of intestinal obstruction, and the abdomen was re-opened. The stomach and upper intestine were empty, also the bowel below the point of constriction, but a loop of small intestine had prolapsed and become adherent to the right broad ligament where sutures had been applied to check

hemorrhage. The intestine was free, and the abdomen closed, the patient dying within a few hours from exhaustion.

Before the second Cesarean section, and after the removal of the ovarian tumor, the operator proposed hysterectomy, as he considered it safer, in view of the removal of the ovarian tumor, than the classic Cesarean section. This proposal was rejected, and he was advised to perform a later operation to deliver the child.

Obstetric Operations. THE NECESSITY OF RECOGNIZING MIDWIFERY AS A BRANCH OF SURGERY. Bonney¹ writes urging the importance of definitely and finally recognizing midwifery as a branch of surgery.

He calls attention to the unfavorable conditions in which many operations must be done in dwelling houses, and states that in England and Wales puerperal fever and the accidents of pregnancy in child-birth caused the death of one mother in every 228 births, between the years 1897 and 1906. From 1907 to 1909 the mortality from these causes lessened to 1 in 270. Puerperal sepsis alone caused the death of one mother in every 609 cases during the year 1909.

The mortality rate under present circumstances cannot be estimated. Bonney is opposed to midwives, and believes that obstetrics should be placed upon a surgical basis regarding the surroundings of the patient, the question of competent assistance, and remuneration for obstetric operations.

PROBLEMS OF OBSTETRIC PRACTICE. In *Surgery, Gynecology, and Obstetrics*, July, 1913, Chipman writes upon some problems of obstetric practice. He describes clearly and emphatically the antiseptic conduct of spontaneous parturition, and draws attention to the most practical and reliable methods of diagnosing disproportion between mother and child.

ABDOMINAL HERNIA. Prochownik² discusses Menge's operation for the cure of abdominal hernia. He makes a transverse incision through the skin down to the fascia over the sac of the hernia. Smaller incisions are made through the fascia without opening the sac of the hernia. By this means it can be seen how widely the fascias are separated, and how widely the recti have been pushed asunder. The sac is then opened from above or to the side, and the tissues which are to be returned to the abdominal cavity are drawn out so that adhesions can be carefully separated. When the tissues have been replaced as normally as possible, the superfluous portions of the hernial sac are removed, and the fascias and muscles brought together by purse-string or other suture. The fascias are brought together as exactly and separately as possible, and care is taken to prevent the accumulation of blood between the different layers of tissues. The recti muscles are then loosened from abnormal attachments and brought together as accurately as possible. All

¹ British Medical Journal, March 15, 1913.

² Zentralblatt f. Gynäkologie, No. 8, 1914.

tension upon the line of sutures must be avoided. If fat is present, it must be dissected out as thoroughly as possible, and, if necessary, drainage of the wound employed, if open spaces have been left. A very simple dressing is placed upon the wound and held firmly, without making undue pressure.

The operation has been done without mortality and with excellent results.

THE TREATMENT OF OBSTRUCTED LABOR. Before the Midland Obstetric and Gynecological Society, a discussion recently occurred in which Wilson¹ and others participated, upon this topic.

Wilson draws attention to the progressive increase in the weight of children when the mother remained in good health, and the importance of the history of previous labors. The method of pressing the fetal head into the pelvis was deemed most important. Border-line cases of disproportion are especially trying, and labor should rarely be induced in a first pregnancy. In doubtful cases, the vulva should be cleansed very thoroughly, and a minute and careful examination made, if necessary, under anesthesia. Neglect in antisepsis during this examination might be fatal to the success of an operation performed later.

In discussion, symphysiotomy and pubiotomy were condemned, axis-traction forceps considered the only instrument advisable, and Cesarean section in clean cases was warmly commended.

CESAREAN SECTION. Lange² reports 28 suprasymphyseal cervical sections. These were done among 42 cases of contracted pelvis. The indications were, danger to the fetus, as shown by altered heart sounds, and the presence of scar tissue uniting the bladder and peritoneum because of the previous performance of extraperitoneal section, and where, in contracted pelvis, evidences of infection developed soon after labor so that the case did not proceed normally.

The effort was made to do the operation extraperitoneally in twenty-four cases, but was successful in but 18. One mother died of septic infection, although many of the cases had been examined before admission to the hospital. One child died of asphyxia. Although ergot was given hypodermically shortly before the beginning of the operation, it was thought necessary to tampon the uterus in 6 cases, and in 7 cases adrenalin was injected into the uterine muscles to secure contraction. Four patients were operated upon for the second time, and in 2, the old uterine scar remained firmly adherent; in 2, it was greatly stretched. In 1 patient thirteen hours of strong pains, with full dilatation, did not rupture the scar; and in another, pains persisted for six hours. In 12 cases there was moderate fever; but with the exception of the fatal case narrated, there was no marked septic development.

¹ British Medical Journal, February 1, 1913.

² Monatsschrift f. Geburtshülfe und Gynäkologie, 1913, Band xxxvii, Heft 5.

Küstner¹ has now performed extraperitoneal section in 100 cases. He makes a longitudinal incision from 3 to 5 cm. from the linea alba to the pelvic brim, not extending to the umbilicus, the incision being carried down to the fascia. He strives to come between the rectus and the oblique and transversalis abdominis muscles. If, on opening the fascia, he comes upon the oblique muscle, he goes carefully through it to avoid wounding the peritoneum. He believes that by this incision he comes upon the lateral wall of the bladder more exactly than when the incision is made on the median line. After the peritoneum has been freed throughout the incision, it is carefully separated above the region of the bladder, and the bladder emptied and carried downward as far as possible. It is often difficult to accurately identify the lower border of the peritoneal sac. This is carried upward as far as possible, until the operator comes down upon the muscular tissue of the lower portion of the uterus. The incision is made right or left, as circumstances indicate, and the fetal membranes are detected by the position and presentation of the child. If the urinary bladder is partly filled, this may be carried to the right or left, as the circumstances demand. When the child is in first position, the lower portion of the uterus is incised upon the left side; and, when the child is in the second position, upon the right. In the majority of cases, incision is made upon the left side. Dextrotorsion of the uterus is less apparent on the left side of the cervix and lower segment than upon the right. The large vessels seem less exposed upon this side.

If the patient is operated upon a second time, it is well to make the new incision on the side opposite to the former. The uterus is opened with blunt-pointed scissors or with a knife, and the presenting part of the child is pressed outward as speedily as possible. Forceps adapted for the purpose are often applied to the head, and a small instrument is used. When the incision is on the left side, and the child is in first position, the occiput is usually delivered first; and where the child is in second position the face usually descends. It is often possible to bring the head down well into the wound before applying forceps, which aids in the operation.

In the second position, the finger may be placed in the mouth and the face brought into a favorable position. Ergot is given subcutaneously so soon as the child is born, and if the placenta does not appear spontaneously, it is forced out by expression. The uterine wound is closed in two layers, the abdominal wound united to the lower angle which remains open, and a strand of vioform gauze is carried to the parametric tissues for drainage. This is done in clean, as well as in infected, cases. If the case has been a clean one, the wound is completely closed in two weeks.

Of the children, three perished from asphyxia, one born of a mother

¹ Zentralblatt f. Gynäkologie, No. 10, 1914.

in eclampsia; one child asphyxiated was revived but died three days afterward, autopsy showing meningeal hemorrhage; the fifth child, asphyxiated, died on the fourth day, section finding ecchymoses in the pericardium and pleura. None of the children was lost because of the method of delivery employed.

In the mothers, in some cases the peritoneum was opened and the operation ceased to be extraperitoneal. If possible, such injury was immediately repaired. In 7 cases the bladder was injured, and in an eighth case it was not clear whether the bladder had been penetrated or greatly distended. In 1 case, during convalescence, a fistula developed between the bladder and cervix, which was afterward closed by operation. In 1 case fistula of the ureter developed, the operation presenting some difficulties, and the puerperal period being complicated by incontinence. The ureteral fistula communicated with the left angle of the cervix. Four months later this was repaired by subperitoneal operation, uniting the left ureter to the bladder. Two of the mothers died—one a poorly developed, weak person from the influence of narcotics administered after the operation. A second died from tetanus. The tetanus bacillus was not found in the secretions of the wound. The peritoneum was smooth and not injected. It was impossible to trace the source of infection. In two cases, erysipelas developed during convalescence. In a total of 103 patients who were operated upon 53 were either suspected or infected cases at the time of operation. In one case the fetal membranes had ruptured sixty-five hours before operation; in another five days; and in another two days. The patients made recoveries uncomplicated by evidences of peritoneal irritation.

Küstner performs this operation in all cases where a living child cannot pass through the pelvis, whether the mother is infected or not, and regardless of the severity of the infection.

Opitz¹ does not believe that the mere fact of extraperitoneal opening of the uterus is of great importance, even in infected cases. He considers that the success of the method arises from the fact that the incision is made through the cervix, which resists infection better than the body of the uterus, that the uterine wall is thinnest at this point, and that the wound is deep in the pelvis, which prevents the spread of infection to the peritoneal cavity.

He opens the abdominal cavity widely, pushes the bladder aside, pushes the peritoneum upward from the uterus, and empties the uterus through the abdominal wound. His results in 37 cases have been excellent. He has seen no accidental injuries.

Weibel,² in 67 extraperitoneal sections, lost but two children—a mortality of 3 per cent. There were two maternal deaths—a mortality of 3 per cent. One of these cases was infected at the time of operation.

¹ Zentralblatt f. Gynäkologie, No. 41, 1913.

² Ibid., No. 45, 1913.

and perished from multiple abscesses; the other was infected before admission.

In the last 52 cases of extraperitoneal section, there have been no maternal deaths. The permanent results of extraperitoneal section were observed in 55 per cent. of the cases which were examined some time afterward. In one-fourth, the cervix was raised and fixed anteriorly. The body of the uterus was somewhat backward, but the patient did not suffer from this condition. In 10 per cent. there were hernias through the scar. One patient with good anatomical results complained of difficulty in walking and in working. There were 3 spontaneous births in cases that had extraperitoneal section previously; 2 of them gave birth to living children, although the labors were somewhat prolonged; 3 patients were afterward delivered by the classic section; and 1 patient, in the third month of pregnancy, suffered so greatly from the condition of affairs that the uterus was removed. In 28 per cent. the peritoneum was opened during operation, but this seemed to produce no bad result.

When the cases were considered perfectly clean, no drainage was used. When they were suspicious or infected, drainage was employed. The extraperitoneal section was done nineteen times for contracted pelvis.

In comparison with hebostiotomy, the fetal mortality of this operation was five times greater than that of section. Hebostiotomy showed a morbidity of 31 per cent. from various complications; extraperitoneal section a morbidity of 22 per cent. The after-results of hebostiotomy were not as satisfactory as those of section. It could not be observed that the operation permanently enlarged the pelvis. Cases operated upon, and subsequently becoming pregnant, in several instances were delivered by other methods. In 25 per cent. of hebostiometries, there was pronounced hemorrhage.

The mortality of hebostiotomy was 2.5 per cent., and this occurred from sepsis.

In summing up the various operations performed in this clinic, craniotomy on the living child has been abandoned for hebostiotomy, extraperitoneal section, or the classic section. In cases of severe septic infection, the total extirpation of the uterus may sometimes be indicated.

Bonney¹ reports the case of a patient five months pregnant, the uterus abnormally large, with small subperitoneal tumors.

At term there was no engagement; section was performed, the uterus greatly enlarged by multiple fibroids, the largest being the size of a melon, in the uterine wall.

The patient and her husband were very anxious to avoid the removal of the uterus, and therefore the uterine incision was closed in the usual manner, and the tumors—six in number—enucleated. Their removal

¹ Journal of Obstetrics and Gynecology of the British Empire, December, 1913.

was attended by considerable hemorrhage, and the tissues were accurately closed by catgut suture. The patient made an uninterrupted recovery.

Bonney reports also a delivery by Cesarean section for fulminant toxemia without eclampsia. The cervix was long and the os closed, so that abdominal Cesarean section seemed the operation of choice. The patient made a good recovery.

Fischer¹ compares Cesarean section, symphysiotomy and hebostiotomy, in the Würzburg clinic. All of the methods for Cesarean section at present in use were employed, including extraperitoneal, transperitoneal, suprapubic, and posterior cervical section.

It is interesting to note that there was no mortality for the children from Cesarean section, and that in 60 cases the maternal mortality was 0.3 of 1 per cent. The morbidity of extraperitoneal section was much higher than that of other methods of section. Contrasting these results with symphysiotomy, he finds a maternal mortality of 33.33 per cent., and a fetal mortality of 33.33 per cent., with a maternal morbidity of 100 per cent.

In hebostiotomy, the mortality of the children was primarily nothing. The secondary children's mortality was 20 per cent.; the maternal mortality after hebostiotomy was 8.33 per cent.; the maternal morbidity was 77 per cent.

CESAREAN SECTION IN RUSSIA DURING THE LAST TWENTY-FIVE YEARS. Pobedinsky,² during the first period, 1886 to 1890, has collected 42 Cesarean sections—a maternal mortality of 40 per cent. In the second period, 1891 to 1900, in 84 Cesarean sections the maternal mortality was 6 per cent. In addition to the classic section, the Porro operation and total extirpation of the uterus were practised.

In the third period, 1901 to 1912, 320 Cesarean sections were reported—51 in the year 1910.

All of the indications now recognized were present in these cases. The maternal mortality was 7.5 per cent., and in 18 operated upon by the extraperitoneal method there were three deaths. The extraperitoneal method has been tried since 1908.

Among the unusual indications for Cesarean section is total prolapse of the uterus in a case reported by Roncaglia.³

The patient had been operated upon for prolapse by the Schauta-Wertheim method, and as she was a comparatively young woman, had not been sterilized. During pregnancy, the fetus developed in the posterior wall of the uterus, which became enormously distended, while the fundus of the anterior wall remained firmly attached above the pubis.

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxv, Heft 1.

² Zentralblatt f. Gynäkologie, No. 21, 1913.

³ Monatsschrift f. Geburtshülfe und Gynäkologie, 1913, Band xxxviii, Heft 5.

The fetus was in transverse position. Cesarean section resulted successfully for mother and child.

Baumm¹ reports 25 extraperitoneal sections with satisfactory results. His twenty-sixth case was that of an imbecile woman who gave no signs of labor, so that complete dilatation had occurred before she was suspected. As the pelvis was highly contracted, extraperitoneal section was at once performed. Infection of the connective tissue of the pelvis behind the pubis and bladder occurred, followed by death.

At autopsy profuse suppuration was found, although the peritoneal cavity remained apparently free.

CESAREAN SECTION SELF-INFLICTED, AND THE RESISTANCE OF THE PERITONEUM. Patek² refers to several cases of Cesarean section self-inflicted. Among others, the case of a girl, aged nineteen years, was brought to the surgical pavilion of the Crown Princess Stephanie Hospital in Vienna, in an unconscious condition, and highly anemic.

Upon examination, there was an incised wound in the middle line of the abdomen, a hand's breadth above the umbilicus, which made an opening 15 cm. in length, and from which were protruding enormous coils of intestine. The patient was anesthetized completely, the skin cleansed, the intestine inspected, and, as the bowel had not been wounded, it was replaced.

In the abdominal cavity was found serous and bloody fluid. When the abdominal organs were inspected, a well-contracted uterus as large as a child's head was found. This was brought out of the abdominal wound, when the whole length of the uterus was found incised, and the cavity opened. In the uterus were portions of placenta and membranes. The fetus and the greater part of the placenta were missing.

The uterus was emptied, closed accurately with silk, the abdominal cavity drained, and the abdominal wall closed. The patient rallied quickly from shock, and the secretion from the drain was so scanty that it was removed on the third day. Two days later the patient suddenly had fever, when an abscess in the abdominal wall was discovered, opened, and drained. There was a profuse discharge, and an infiltration in the right parametrium. This persisted for six weeks, the patient finally recovering. She was discharged in good condition eight weeks after the operation.

When the girl's history was investigated, it was found that she had been illegitimately pregnant and that she had tried to commit suicide during the early months of pregnancy, but had failed. As pregnancy drew to its close she determined to commit suicide, and telling her mother that she wished to bathe, she filled a large tub with hot water, seated herself in it, and opened her abdomen with one vigorous stroke made with her father's razor, which she had stolen. She suffered very little

¹ Zentralblatt f. Gynäkologie, No. 27, 1913.

² Ibid., No. 30, 1913.

pain, but the sight of blood caused her to faint, and when her mother entered the room and revived the girl, she stated that she had wounded herself in the abdomen. The child had lived, but had drowned in the water of the tub. The child and placenta were afterward found in the tub.

The patient was afterward acquitted, married, and became again pregnant. In the second half of her pregnancy she was examined by Patek. The abdominal scar was 20 cm. long and 2 to 3 cm. broad, pigmented with a dark-brown color, and in the lower third was a very thin portion which easily protruded. The smooth anterior wall of the uterus could be recognized through this portion of the scar. As pregnancy advanced, this hernia grew larger and the recti muscles separated somewhat. Labor developed, but the pains gradually subsided, and small doses of secacornin and pituglandol were given. The uterus then acted vigorously and promptly, and a male child was spontaneously born. Fifteen minutes later the placenta was normally delivered. There was no postpartum hemorrhage, and the patient made a good recovery from labor. The hernia and the separation of the recti muscles grew less, and the patient's general health remained excellent.

Klein¹ reports Cesarean section for uterus bicornis. In view of the existence of the median partition, the enlarged right horn of the uterus was opened by a transverse incision. This was not large enough to permit the birth of the child, and the incision had to be carried across the remaining portion of the uterus. There was considerable hemorrhage, as the median partition had been lacerated, but this ceased when the tissues were accurately closed by suture, and the patient made a good recovery.

THE DANGERS OF LABOR AFTER OPERATIVE ANTEFIXATION. Küstner² contributes a paper with illustrations, drawing attention to the dangers of labor in cases that have been operated upon by antefixation of the uterus. It is impossible in these patients for the uterus to assume its normal relation with the axis of the pelvis. In the case which he reports and illustrates, labor came on and efforts were made to perform version, or to pull down the cervix, and thus to secure the expulsion of the child. The blunt hook and cranioclast were employed, but with unsatisfactory results. Version was finally performed and the feet brought down, with the hope that the patient could expel the child. The uterine contractions were cramp-like in character, and the fetus was finally expelled without especial hemorrhage.

The patient developed shock and the placenta was quickly and readily removed by the hand, but the patient speedily died with air hunger, the area of heart dulness becoming imperceptible to tympanitic resonance over this portion of the chest.

¹ Zentralblatt f. Gynäkologie, No. 13, 1913.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1914, Band xxxix, Heft 2.

The child was stillborn, large in size and macerated, and had evidently been dead for some time before birth.

At autopsy the right side of the heart contained abundant bubbles of air, the liver was fatty, there was scar tissue in both kidneys with hydronephrosis, and the ureters were somewhat dilated. In the pre-vesical space and left parametrium, there was edema and bloody fluid. The peritoneum was not wounded, nor was there fluid or blood in the peritoneal cavity. The uterus was opened through the posterior wall. The placenta had been attached on the left side of the anterior wall and above the internal os, and near the site of the placenta the uterine wall was very thin, dark in color, and infiltrated with blood, the muscular tissue having been reduced to a very thin layer.

The uterus was removed and carefully examined, when degeneration of the uterine wall by overdistention was strikingly demonstrated. The condition of the tissues above the symphysis indicated that practically rupture of the uterus at that point had occurred, while the presence of air in the heart was explained by air embolism.

THE PUERPERAL PERIOD.

Some Sequelæ of Labor. Solomons¹ gives the statistics obtained by examining 543 primiparæ at the Rotunda Hospital in Dublin, sixteen days after labor. Of these, 219 were in normal condition so far as the pelvic organs were concerned; 219 also had lacerations of the cervix only; 27 had some involution; 25 had lacerated cervix with retroversion; 14 retroversion only; 12 lacerated cervix with non-union of the perineum; while 8 had lacerated cervix, non-union of the perineum, and retroversion; and 7 had non-union of the perineum only. The remainder, forming but a very small number, showed complications of parametritis, retroversion with non-union of the perineum, cystitis, prolapse, and one had pyosalpinx.

In percentage, 40.33 were normal; 49.62 per cent. had laceration of the cervix; there was retroversion in 9 per cent.; non-union of the perineum in 5.5 per cent.; subinvolution in 5 per cent.

The writer concludes from his investigations that cervical laceration, after normal labor, is very common. When hemorrhage results, immediate suture should be practised. If there is no bleeding, suture in two months is indicated. It might be well to make a routine examination of all women at the end of the child-bearing period, when cervical lacerations should be repaired.

Retroversion of the uterus, when not complicated by inflammation, is caused by lying upon the back. Postural treatment is most efficient, and such patients should be examined at least once a month, for four

¹Journal of Obstetrics and Gynecology of the British Empire, July, 1913.

months following confinement. When the perineum fails to unite when immediately sutured, if infection does not develop, a second operation should be done so soon as it is evident that the first has not succeeded. In uninfected cases, postural treatment and gymnastic exercises are useful during the puerperal period.

Our knowledge is not yet sufficient to determine the value of early rising.

This question has been studied extensively by Knapp in the clinic in Prag.¹ He finds that backward position of the body of the uterus is frequently found when cases are systematically examined during the puerperal period. Primiparae and those who get out of bed late in the puerperal period embrace the greater number. In one-half the cases, the condition develops after the second week of the puerperal period. In one-third of the cases, the uterus assumes gradually the normal position.

Well-marked subinvolution predisposes greatly to retroversion, and also hyperinvolution has a similar influence. Cases which undergo spontaneous cure seem to arise from some subjective condition, and, to detect this, an examination at regular intervals is indicated. Unquestionably, remaining long in bed predisposes to retrodisplacement. In primiparae, and those who get up early, involution proceeds more slowly. The persistence of the lochial secretion seems to have an important bearing on retrodisplacement. Involution is more prompt and efficient in primiparae than in those patients who get up early, and excessive involution is most often observed in these cases.

There seems to be no difference in the influence of the weight of the patient, whether the puerperal woman leaves her bed early or late. Diastasis of the abdominal wall occurs equally and independently of the time of getting up. It seems evident that the condition of the inguinal lymphatics and lymphatic channels is of importance regarding involution.

The internal examination of puerperal patients is of importance in detecting puerperal gonorrheal or syphilitic infection. The possibility of eczema upon the external genitals should not be forgotten, and a granulating surface in this condition may expose the patient to the danger of infection.

Puerperal Septic Infection. Bondy² publishes an extensive review of our present knowledge of puerperal septic infection.

As regards prevention, the question of preliminary douching is decided in the negative, because such manipulation lessens the patient's native powers of resistance. Some observers report a lessened bacterial content of the vagina after the use of antiseptic douches.

As regards the treatment of infection, if operation is to be undertaken,

¹ Archiv f. Gynäkologie, 1913, Band c, Heft 3.

² Monatsschrift f. Geburtshilfe und Gynäkologie, 1913, Band xxxvii, Heft 6.

Pankow urges that it be promptly done. To determine when ligation of the veins of the broad ligament should be performed, Schottmuller and Bondy believe that the presence of anaërobic streptococci in the blood is a clear indication. Warnekros did not have success from this operation.

There is a wide difference of opinion concerning many points in the prevention and treatment of puerperal septic infection, but those methods of treatment which have proven most valuable are not clearly comprehended.

A remarkable case in which the uterus was perforated, the appendix torn away, and multiple injuries of the intestine cured by operation, is reported by Braude.¹ The patient was a widow, previously healthy. When four months pregnant she was taken with pain and hemorrhage, for which she was curetted, until the physician performing the operation thought the uterus was empty, when he gave an intra-uterine douche. The patient was then brought to the hospital and was able to walk up the stairs into the ward.

Upon examination the abdomen was empty, distended and tender on pressure, especially on the right side beneath the umbilicus. The statement was made that the physician had removed a piece of tissue resembling a large cord, with tenaculum forceps, introduced into the uterus after the curetting. Upon examination this was found to be the appendix, and as evidently the uterus had been ruptured, and the intestine wounded; abdominal section was performed. Three perforating wounds were found in the ileum, and one coil was practically severed. These injuries were immediately repaired by suture. A small portion of the appendix was still adherent. In Douglas' pouch was found a portion of the vertebral column of the fetus.

Upon examining the uterus, an extensive laceration at the fundus was found, the uterus was extirpated, and a strand of gauze passed into the vagina for drainage. The left ovary had also been injured and was removed, and the peritoneum sewn over the stump.

The patient made an apparently good recovery, getting up on the tenth day. On the following day she had a sudden attack of dyspnea, with normal temperature, and pulse of 100. An embolus was found in the right lung. After eight days' rest in bed she recovered from this, and on the twenty-third day left the hospital in good condition.

The case illustrates the danger of using any form of tenaculum forceps to remove debris from the uterus.

Palm² describes a case of septicopyemia in pregnancy at the ninth month, from secondary infection of puerperal wounds. The patient was admitted to hospital with frequent respiration, marked cyanosis, and high fever. Nothing abnormal could be found in the uterus or organs, nor could other causes for fever be demonstrated. The only

¹ Zentralblatt f. Gynäkologie, No. 52, 1913.

² Ibid., No. 10, 1913.

symptom detected was a systolic murmur at the mitral area and a trace of herpes labialis in the stage of recovery. Metastases developed in various portions of the body with delirium, tenderness over the abdomen and uterus, and bloody lochia, followed by death four weeks after delivery.

Upon bacteriologic examination, the pneumococcus was obtained from portions of various organs.

Watkins¹ gives the results of his observations in 100 cases of puerperal septic infection, most of whom were severely infected when brought to hospital. Ninety-one recovered, and nine died; 7 of the fatal cases had general peritonitis and were hopeless on admission; one died from a large pelvic abscess, which was incised and drained. Vaginal section was made twelve times for exploration and drainage; 49 of these patients had pelvic exudates, but in none of these cases was drainage necessary by incision. While the patients had fever, these exudates showed very little tendency to become absorbed; but so soon as the temperature fell, recovery proceeded more rapidly.

In six patients, abdominal section was performed, and, in two, a large solid inflammatory exudate, involving the intestines extensively, was present.

In both these cases, the abdomen was closed without disturbing the exudate. Four weeks later, when the patients left the hospital, the exudate had entirely disappeared.

In one case, abdominal section was made for suspected tubal pregnancy, but a streptococcus abscess involving the top of the left broad ligament, ovary and tube, was found. After the operation, the patient had high fever, with extensive suppuration and sloughing, and was dangerously ill for weeks.

It was thought that the patient would have recovered without disturbance had the operation not been performed.

In 60 of the 100 cases the treatment was supportive measures only.

Watkins concludes that puerperal infection is essentially a systemic disease, and that its treatment should be principally general, by increasing the body resistance and encouraging the development of immunizing bodies. Retained products of conception should be left to escape spontaneously, except when hemorrhage is present, and gauze packing is indicated.

The treatment which is usually given in these cases is often more dangerous than the disease.

THE SOURCES AND AVENUES OF PUERPERAL AUTO-INFECTION. Ahlfeld² discusses the question of auto-infection and reports illustrative cases. His conclusions are that there are many possible sources for septic infection, and that so-called auto-infection must be admitted as occurring.

¹ American Journal of Obstetrics, September, 1913.

² Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiii, Heft 1.

He reviews the different efforts made to isolate a single cause, and to prove that all cases result from it, describes the failure of this investigation.

LOCALIZING PERITONITIS OF PUERPERAL ORIGIN. Hicks¹ believes that simple drainage through Douglas' pouch should always be adopted when the local area of infection is within reach. The attempt to radically remove a pyosalpinx or infected ovary will set up general septic infection, which may be quickly fatal. The parametrium is nearly always infected, and, although there may be no pus in the broad ligaments, the lymphatics will take up bacteria readily if opened during operation. When simple drainage is not possible, the obstetrician should wait, watching carefully for signs of extension of the infection. As time goes on the organism becomes less virulent, and the natural powers of resistance increase. Fowler's position is indicated.

The complication to be feared after radical operation is septicemia in its worst form.

THE SURGICAL TREATMENT OF SEPTIC PELVIC THROMBOSIS. Jellett² records 3 cases with chills, high temperature, and rapid pulse, in which he operated upon septic pelvic veins.

The first case was done early, removing a large thrombosed and suppurating vein by abdominal section. In the second case, operation was done on the thirty-ninth day, removing a thrombosed ovarian artery and vein. The patient had several chills, but recovered. In the third case, the whole ovarian vein contained pus, and there were two abscesses in its vicinity. The patient had first improved, and then grew worse, and on the thirtieth day a second operation was undertaken to tie the iliac vein should it be found thrombosed. This was not present, but there were thrombosis and suppuration of the uterine vessels.

The patient died after hysterectomy on the thirty-fourth day.

THE TREATMENT OF PUERPERAL STREPTOCOCCEMIA WITH INTRAVENOUS INJECTIONS OF MAGNESIUM SULPHATE. Harrar³ has treated 14 cases of puerperal streptococcus infection with intravenous injections of magnesium sulphate. A 2 per cent. solution in freshly distilled water was employed, and from 350 to 400 c.c. were given.

The remedy was absolutely harmless in these cases. It is most useful early in the history of infection, before secondary localization has occurred. When there is secondary thrombophlebitis or pyemia, it apparently is not useful. It seems to influence chiefly the organisms circulating in the blood. It shortens the course of the bacterial toxemias in which the bacteria cannot be demonstrated in the blood by culture, and has reduced the bacteria in puerperal bacteremia, especially in streptococcemia, from 93 to 20 per cent.

¹ Journal of Obstetrics and Gynecology of the British Empire, May, 1913.

² British Medical Journal, March 8, 1913.

³ American Journal of Obstetrics, November, 1913.

THE NEWBORN.

Aspiration of the Fontanelle for Subdural Bleeding in the Newborn. Henschen¹ draws attention to the value of aspirating the anterior fontanelle for collections of blood beneath the dura, the result of birth-pressure. This convex hematoma, or supratentorial hematoma, is formed by the rupture of veins in the pia mater. When blood accumulates at the base, it comes from the transverse sinuses and from enormous vessels in the membranes of the brain.

The mortality of tentorial hemorrhage and laceration is, at the lowest computation, 10 per cent. When the hemorrhage is anterior, a quiescent period of eleven or twelve days follows the hemorrhage before serious symptoms develop. When the bleeding is near the medulla, although symptoms may not develop at once, the child is liable to sudden attacks of cyanosis with spasmodic breathing, speedily followed by death. When the hemorrhage is anterior, the child is restless or apathetic, cries out suddenly, has disordered pulse, increased tension, and swelling of the anterior fontanelle; there is a difference in the pupils if the hematoma is on one side only, increase in reflexes, a positive Babinski reaction, slowing of the pulse and breathing, conjugate deviation of the head and eyes, rigidity of the extremities with epileptiform convulsions, and paralysis of the facial, hypoglossal and other nerves, with hemiparesis and subnormal or slightly increased temperature. When the blood is extravasated in the vicinity of the medulla, the child is apathetic or cyanotic, cries feebly, there is stiffness of the neck and irregular breathing with attacks of apnea.

The severity of the condition, the writer thinks, justifies puncture of the greater or smaller fontanelle or of the spinal canal, between the second and third cervical vertebrae, for diagnostic purposes. This is also useful as a therapeutic measure, as it lessens the pressure upon nervous matter. In the first puncture from 10 to 15 c.c. may safely be removed, and, should a second puncture be made, from 80 to 100 c.c. may be removed.

The number of operations reported is 16, with 7 recoveries.

The writer reports a case of difficult labor in which a large bag was used to secure full dilatation, followed by spontaneous birth in brow presentation. The child was apparently fairly developed, and cried loudly. Three hours after birth, a well-marked tumor developed upon the forehead, and the child had sudden collapse, with cramp-like contractions of both arms, and greatly increased reflexes. The anterior fontanelle was punctured and fluid and partly clotted blood aspirated, an incision being made on the right side where the frontal bone meets

¹ Zentralblatt f. Gynäkologie, No. 25, 1913.

the parietal, and the bone was raised. The dura was very dark blue in color and very much distended. In the subdural space was 10 c.c. of partly clotted blood. The bone was replaced and the skin sutured, the dura being left without suture.

The child died in convulsions, and, on section, a large hematoma was found over the left hemisphere, the tentorium was uninjured, and there was no hemorrhage at the base. The blood had clotted on both sides of the anterior portion of the brain.

The Subsequent Development of Prematurely Born Children. Wall,¹ from his studies of this question, does not believe that the statement made by neurologists that prematurely born children are predisposed to diseases of the nervous system, idiocy, imbecility, and epilepsy, can be proved. The greater number of prematurely born children develop normally. A portion of them are slow in development and learn to walk and speak more slowly than the average children. Night terrors and enuresis are sometimes present in these cases.

This delay in development is not permanent and can be remedied. Ample time must be given to the children to make up for their premature birth. The severity of the handicap under which these children suffer is in inverse proportion to the weight of the children, and is in direct relation with the lack of proper care and nourishment from which such children often suffer.

The Natural Nourishment of the Newborn. Jaschke² has studied the best methods of procuring proper nourishment for the newborn, and gives his results in 153 children so treated.

All of these were fed upon breast-milk obtained, if possible, from the mother of the child; 64.7 per cent. developed perfectly normally, in spite of various degrees of icterus. Among these were cases in which the mother had not sufficient milk for the child and in which the milk of a wet-nurse was utilized. In 89.5 per cent., the nourishment of the child was satisfactory, if not ideal; while in but 10.5 per cent. was the method unsatisfactory.

The paper, which is of considerable length, emphasizes the necessity for using breast-milk exclusively, and, if necessary, obtaining such by pumping the breasts of the wet-nurse to make up for the lack of the mother's milk.

Fetal Death Due to a Knot in the Umbilical Cord. This somewhat rare occurrence is reported by Holzapfel.³

Just before labor the position and presentation and condition of the fetus were normal. Two days before confinement, the mother ceased to feel the movements of the child. Labor proceeded normally in six hours. The child was stillborn and partially macerated. The umbilical

¹ Monatsschrift f. Geburtshilfe und Gynäkologie, 1913, Band xxxvii, Heft 4.

² Zeitschrift f. Geburtshilfe und Gynäkologie, 1913, Band lxxiv, Heft 2 and 3.

³ Ibid., Heft 1.

cord was 118 cm. long and had in the middle a perfectly formed knot, which was tightly drawn. The portion next the fetus was edematous and infiltrated with blood, while the distal portion beyond the knot was pale and much thinner. The body of the child showed no abnormalities.

Examination of the knot showed that it had been tightly drawn but a short time before birth. The cord contained one vein and but one artery, and microscopic examination showed considerable difference in the condition of the cord in its distal and proximal portions. It seems probable that the child drew the knot tightly by the motions of its legs. The artery was first occluded, and finally both vessels.

The mother assigned the accident to active work which she did, but there is no reason to believe that this was the cause.

Obstetric Measures for Preserving the Life of the Child. Keilmann,¹ in the hospital at Riga, draws attention to the importance of having the mother nurse the child, or in giving the child the advantages of human milk rather than artificial feeding.

The quantity of milk obtained from the mother was carefully measured, and it was interesting to observe that out of 1106 mothers, 769, or 69.6 per cent., were able to nurse not only their own children, but another child in addition; 57 mothers gave more to the stranger than to their own child. More than 70 per cent. of these mothers had more milk than one child actually needed. It was observed that the better the mother's care, the better the result in the nourishment of the child.

Intra-uterine Fracture. Smith² reports the case of a child born in breech presentation, the attending physician bringing down the feet without difficulty. The right leg was deformed, but on examination the deformity was an old one and was not caused by delivery. On later examination, there was found a sharp bend in the right leg at the junction of the middle and lower thirds, which was fixed and firmly united. The right foot was slightly smaller than the left, which was normal; the right leg slightly shorter than the left.

There was no family history obtainable. The mother stated that two months before confinement, while walking on a porch, her right leg and thigh went through a hole in the porch, so that her body was slightly jammed. The boards of the porch had to be sawed away before she could be released. She suffered only bruising and was about the next day. Two weeks before confinement she fell on the ice without apparent injury. Several weeks later an x-ray revealed a line of fracture from the tibia in the child. The centres of ossification present in the normal extremity were lacking in the right. The foot on the injured side was slightly smaller than the other; the tibia, 1 cm. shorter.

Under ether anesthesia, a fruitless attempt was made to break the

¹ Zeitschrift f. Geburtshülfe und Gynäkologie, 1913, Band lxxiii, Heft 2.

² Surgery, Gynecology, and Obstetrics, September, 1913.

bones. An incision was then carried over the tibia and fibula, the lines of union easily found, and the bones severed with the chisel. No attempt was made to wire. The incisions were closed with catgut and a plaster bandage applied. After the operation, there was sufficient swelling to make necessary the opening of the plaster bandage.

The child recovered with but slight deformity, the foot being tilted outward.

At a second operation, when the bones were exposed, the ends were in good apposition but angulated; the bones were severed with a knife, the periosteum of the tibia sutured with chromicized catgut, and a posterior splint applied. Although the child moved vigorously afterward, a good result, with very slight shortening, was obtained.

Smith has collected 43 cases, of which 32 were simple fractures; 5 were multiple. The clavicle was the bone most frequently fractured.

In most of the cases there was a history of some disturbance or violence to the mother, and there was some abnormality during pregnancy. The presence of intra-uterine fracture cannot be denied, and may have a medicolegal bearing.

Thymus Death. Crotti¹ adds to 5 cases of thymus hyperplasia previously reported,² two others.

The seventh of this series was a female infant delivered by forceps and apparently doing well. After a few hours the child had a choking spell, which yielded to ordinary treatment, but later in the evening a fatal attack lasting fifteen minutes occurred. There was dulness on percussion over the thorax in front, extending downward to the cardiac dulness.

Autopsy showed the thymus very greatly enlarged. This is well shown in a colored illustration.

Dyspnea is the most important symptom, and may be only a labored respiration or an intense fit of choking. This condition begins in the first weeks of life, and is rarely present after the second year. Pressure on the trachea occurs at two different points—between the posterior surface of the manubrium sterni and the first and second vertebræ. The second is between the brachiocephalic trunk and the left common carotid. In children, the first form is most usually found; in adults, the second.

While all cases of dyspnea in infants may not be caused by enlarged thymus, it is frequently present. The enlarged thymus may come in contact with, and compress, the right and left auricle and ventricle, the superior vena cava, the aorta, the brachiocephalic trunk, and the left common carotid. When this is considered, it is not strange that such serious results follow.

The exact relation between the thymus and the thyroid is unknown.

¹ Journal of the American Medical Association, February 22, 1913.

² Ibid., January 11, 1913.

Davis¹ reports the case of an infant delivered without birth pressure, by Cesarean section, the mother having a low attachment of the placenta with partial separation. When the uterus was opened the membranes were unruptured, but the child moved violently in the membranes, and several respiratory movements occurred during delivery. The mother's recovery was uncomplicated.

It was thought that the infant might have inspired amniotic liquid at the moment of birth, although it cried naturally and did well for twenty-four hours, but died in spasm with dyspnea. A greatly enlarged thymus was found upon autopsy.

In reviewing the literature of the subject, it was observed that in some cases unquestionably violent efforts at resuscitation may produce enlargement of the thymus. The effort has been made to save life in these cases by resection of the thymus with partial resection of the manubrium sterni. This has not been successful beyond the prolonging of life for a short time.

The Surgical Treatment of Brachial Birth Palsy. Taylor² adds 36 to 7 operative cases previously published, making 43 in all. These children varied in age from four weeks to nineteen years.

The chief factor in producing this condition lies in forcibly separating the head and neck from the corresponding shoulder, whether this occurs through too forcible instrumental traction when the shoulders are impeded, or whether the head and neck are used to pry out the shoulder from under the pubis, or whether, in breech extraction, too great force is put upon the shoulders for the delivery of the aftercoming head. Mild cases occasionally develop after spontaneous birth, but most can be traced to difficult and artificial delivery. The injuries consist in rupture of the deep cervical fascia in front of the roots of the plexus, rupture of the perineural sheaths, and rupture of the nerves themselves with the small vessels of the various structures. The tissues form a firm cicatrix which blocks nerve impulses. The roots usually rupture in order from above downward. In addition to extraspinal injuries, there are undoubtedly cases where the spinal cord itself is involved.

As a result of this accident, the bones of the extremity do not develop normally, the upper end of the humerus remains infantile, and posterior dislocation of the head of the humerus is seen in some cases. The elbow- and wrist-joints are maintained in faulty position. As contractures and paralyses develop, these faulty positions become permanent. The whole extremity is rotated inward with pronation of the arm and hand and posterior displacement of the upper end of the humerus. Growth is interfered with, and the deformity increases with age. There is a tender scar in the region of the damaged nerves. The prognosis for complete recovery is bad, as deformity and paralysis in some degree persists.

¹ American Journal of Obstetrics, May, 1913.

² American Journal of the Medical Sciences, December, 1913.

Operation is the only efficient treatment, and may be done as early as from three to twelve weeks. It is not dangerous, amounting essentially to an incision through the skin and fat at the base of the neck. Where the roots have been torn from the cord, they must be literally implanted into neighboring roots. If the neighboring roots have been damaged enough to require resection, the distal trunks may be sutured in a bunch to the proximal roots still attached to the cord. After operation, the head and shoulders must be held in approximation for weeks by a steel brace fitted before operation. There must be systematic and persistent after-treatment. A perfect result can never be expected, but there will be considerable improvement.

Does Pituitrin Injure the Child? Spaeth¹ finds in the literature several cases where, following the administration of pituitrin, such violent uterine contractions have occurred that the child's heart sounds were greatly altered, and, in one case, the physician in attendance was obliged to extract the child quickly with forceps to save its life. It was born deeply asphyxiated, but revived.

The writer reports the case of a primipara with normal pelvis, breech presentation, and failure of descent through weak uterine contractions. Five-tenths c.c. pituitrin was given subcutaneously after the rupture of the membranes, which produced a few strong regular pains, which died away. A second injection produced uterine contractions which brought the breech into the brim of the pelvis. The patient was then partially anesthetized, the perineum incised to permit rapid extraction of the child, and the child was delivered quickly and easily. The cord was once around the neck, but was making no pressure. The child was asphyxiated, the heart beating very slowly but its beat plainly evident. The child could not be revived and died in half an hour.

Autopsy showed no injury to the cranium or spinal column, no rupture of the cerebral membranes, and no hemorrhage. The thymus was not enlarged, the heart, lungs, and kidneys normal, and there was no inspirated material in the trachea or bronchial tubes.

Of the preparations of pituitrin commonly used, pituglandol is a little less effective than the others. In the present instance, one of the preparations most used and considered reliable, was employed.

Epidural Hematoma in the Spinal Canal of the Newborn. Gröme² reports 4 cases of hematoma of the cord ending fatally. In no case was there evidence of trauma or especially severe birth or birth pressure. Syphilis was absent. There was no injury to the spinal column, nor were the ligaments ruptured.

Upon examining the body after death, a mass of dark, coagulated blood was found several mm. in thickness, making pressure upon the cord.

¹ Zentralblatt f. Gynäkologie, No. 5, 1913.

² Ibid., No. 51, 1913.

In these cases there is no explanation for the occurrence of the hemorrhage.

Further Observations upon Birth Fractures. Truesdell¹ adds 3 to those previously reported, making 14 in all of cases of birth fracture occurring at the Lying-in Hospital; 3 died, the remainder being constantly under observation for eighteen months.

Frequent x-ray examinations have been made to determine the progress of union. Of the 14 cases, 10 occurred during version and breech extraction; 3 during simple breech extraction; and 1 in spontaneous vertex delivery where there was difficulty in extracting the anterior arm from a narrowed pelvic outlet. The fractures were transverse near the centre of the shaft of the humerus, just below the insertion of the deltoid. In one case in which the arm was across the child's back the line of fracture was oblique. External angulation was the most frequent result, and sometimes lateral displacement. There was no overriding, but wrist-drop was present.

In a case coming to autopsy, there was no injury to the brachial vessels or musculospiral nerve. The periosteum was torn, through which the bone ends could readily protrude. Bleeding had taken place from the fractured bone ends, the torn periosteum, and surrounding muscle.

Success in treatment was obtained by the use of a splint first made of sheet-lead, cut and folded in such a manner as to press the upper fragment inward and the lower fragment outward, immobilizing them. The splint was extended across the infant's back to fix the entire arm. Sheet aluminum was later substituted for lead. Union has occurred in all the cases firmly, in the majority of cases in three weeks. Deformity is completely eradicated when recovery becomes perfect. In one case of fractured humerus, Erb's paralysis developed. Ten cases of fracture of the clavicle were observed; 2 cases of fracture of the femur.

Acute Tetany of the Newborn. Krüger-Franke² reports a twin case in which the first stillborn was macerated. The second was asphyxiated and had inspired foul amniotic liquid. It was resuscitated and cried, but not as vigorously as a normal child.

The infant became sluggish, with tonic cramps of the muscles of the body, trismus being absent, but opisthotonus was present. The extremities were slightly flexed, which could not be overcome. On the second day the child died, having vomited foul material.

A complete section could not be obtained, but the abdomen was opened and a piece of intestine removed. Streptococci were found abundantly in its contents. Whether the child obtained the infection from the amniotic contents it is difficult to determine.

¹ Bulletin of the Lying-in Hospital of New York, June, 1913.

² Zentralblatt f. Gynäkologie, No. 2, 1913.

Immediate Treatment of Depressed Fracture of the Skull in the Newborn. Kosmak¹ reports 3 cases of depressed fracture of the skull in the newborn, treated by immediately raising the depressed bone by an elevator. This consists of a handle terminating in a short right-angled hook. The point of the instrument is forced by firm and constant pressure into the midpoint of the depressed fracture, and after the point has penetrated the inner table of the skull the handle is turned at right angles to the surface, and with steady outward traction the depressed bone is elevated. The only preparation needed is to clip the hair over the area through which the perforation is to be made, and apply tincture of iodine. After the operation, a sterile bandage is applied, and the mother directed to keep the child on the side opposite the seat of fracture. The cases reported did well.

The Infant Pulmotor for the Treatment of Asphyxiated Infants. Edgar² has applied the Draegen adult pulmotor in the treatment of asphyxiated infants. The mouth, nose and throat are cleared of mucus, the infant placed in the dorsal position, and the shoulders elevated, with the head thrown back and the tongue drawn forward, or caught under the edge of the mask which is placed firmly over the nose and mouth. The slide valves on the water gauge for pressure of inspiration and expiration, are placed at the zero mark. The valve of the oxygen cylinder is opened and pressure read on the test dial. The respiratory rhythm lever is moved slowly from the inspiration to the expiration mark and *vice versa*. The esophagus is closed by backward pressure on the larynx. The inspiratory and expiratory pressure is increased gradually, in accordance with the movements of the chest.

Infant Mortality in the First Weeks of Life. Koplik³ reviews extensively the conditions which destroy infant life in the first four weeks of life.

During the first week, premature birth, congenital malformation, and feeble vitality, are the greatest causes. Here depressing influences which affect the mother play a large part. The first week of infant life shows the greatest mortality—71 to 73 per cent. of the whole number of deaths in the first four weeks. In the second week, the mortality falls to 13.5 per cent.; 8 per cent. in the third week; and 5 to 7.8 per cent. in the fourth week.

In cases of marasmus or diarrhea, death results not so much from artificial feeding as from ignorance and indifference in carrying out methods of artificial feeding properly. When the child is at full term artificial feeding may be safer than the mother's nourishment. Wet nursing generally results in the sacrifice of one of the children cared for.

Ophthalmia Neonatorum in London. Harman⁴ reviews the first official statement concerning purulent conjunctivitis in the newborn

¹ Bulletin of the Lying-in Hospital of New York, March, 1913.

² American Journal of Obstetrics, February, 1913.

³ Journal of the American Medical Association, January 10, 1914.

⁴ British Medical Journal, May 24, 1913.

in London, recently issued. Of 100,830 births, 850 cases of ophthalmia neonatorum are officially reported. Among 278 cases occurring in the practice of midwives, the history of the child was carefully followed, and successfully, in 231; of these, 218 recovered, and 139 had permanently damaged vision. This gives 5.6 per cent. as permanently injured. This corresponds very closely with cases studied in private practice.

Of the 13 cases permanently injured, 3 were blind in both eyes.

There was a history of vaginal discharge in 7 of the 13. In every case except one, the eyes were cleansed with some antiseptic immediately or soon after birth. In the one case, where this was not done, the disease did not appear until the eleventh day after birth, so that it is almost certainly a secondary infection. Boracic solution was most often employed in prophylaxis, bichloride of mercury up to 4000, next in frequency silver nitrate in a small percentage, and biniodid of mercury once only. In 22 cases, sterile water was used.

The writer concludes that leucorrhea in the mother during pregnancy should receive competent treatment. When there is a vaginal discharge at labor, this should be removed from the vagina before delivery. The infant's eyes should be cleansed immediately after birth.

The precautions taken to prevent ophthalmia in these cases seem curiously inefficient. Boracic solution can hardly be depended upon, and bichloride of mercury does not commend itself for this purpose; but that silver in some form should have been used so little seems surprising.

In our own experience in the Maternity Department of the Jefferson Hospital, all ward cases and private cases with a suspicion of vaginal discharge receive one prophylactic irrigation, at the beginning of labor, of lysol and tincture of green soap combined. After delivery, the child's eyes are cleansed with boracic solution, and argyrol is dropped into the eyes. Conjunctival catarrh from irritation occasionally develops, and, in rare instances, the gonococcus is present; but severe ophthalmia is unknown, and permanent damage to the eyes is of the rarest occurrence.

Obstetric Pharmacology. Much attention has been given of late to *pituir*in and other substances recently introduced and used as stimuli to uterine contractions during labor.

In the *Archiv f. Gynäkologie*, Band ci, Heft 3, 1914, Tassius reviews his experience with this substance in the Breslau clinic. He has had good results in the use of *quinin*, where uterine contractions are weak from the beginning of labor, with long pauses between the pains, and also in cases of abortion. In the latter he has combined hot baths, hot fomentations, and baths of hot air, to stimulate labor. *Pituglandol* has given good results where uterine contractions fail during the period of expulsion and where it is desired to secure quick and vigorous action of the uterus to render unnecessary the employment of forceps. In these cases, *pituir*in and *glaudivit*in have also given good results.

Secocornin has been useful in checking postpartum hemorrhage and in correcting atony of the uterus after labor. In some cases, it has been combined with pituglandol and with hot applications over the abdomen. These substances have been used to stimulate uterine contractions when labor had begun, but the expulsive action of the uterus had grown weak.

To induce labor and excite uterine contractions, dilatation of the cervix followed by capsules containing *glycerin* have given especially good results.

In 25 cases, he has employed a recent preparation of the hypophysis called *coluitrin*. This was used in 17 cases in secondary uterine inertia, and in 8 in primary. The dose varied from 1 to 6 c.c. The best results were obtained by repeating small doses. There was no injurious effect from the drug, and in 12 cases it seemed to exert a stimulating influence. In five to ten minutes the pains became better, and the improvement lasted for several hours. The uterine contractions persisted from one-half to one minute, with intervals of two to five minutes. The contractions were not so powerful as those secured by other preparations of the hypophysis. In 2 cases, he employed three different preparations of the hypophysis—glanduitrin without result, coluitrin without result, and an hour and a half later 2 c.c. of pituglandon, when the pains promptly became vigorous and the labor terminated.

From his experience, he believes that coluitrin is of value and that the average dose should be 2 c.c.

Gardlung¹ reports his results in the Stockholm clinic with the use of *extract of the hypophysis*. The results were good, and without injurious effect, but in cases in which atony of the uterus was pronounced, and the patient reacted powerfully to the drug, the child was in danger of asphyxiation. In postpartum bleeding, the effects were not as efficient.

Lieb² contributes a paper, illustrated by tracings, upon the pharmacological action of *ecbolic* drugs. He believes that *ergot* owes its action to several constituents, of which ergotoxin alone is specific. All of them stimulate the uterus, but each has a distinct pharmacological action. In obstetrics no one of them can replace the action of whole ergot.

Extracts of the posterior lobe of the pituitary gland stimulate all smooth muscle, and he believes that this substance is the most reliable *ecbolic* for obstetric use. Its promiscuous employment during labor cannot be too strongly condemned. Experimentally, quinin stimulates the uterus when isolated from the body of an animal, and undoubtedly has clinical value in the human subject. When quinin derivatives cause improvement in menorrhagia and metrorrhagia, it is due to a direct action on the uterine muscle. *Fluidextract of viburnum* stimulates the isolated uterus. Its action in dysmenorrhea is not due to an effect upon the uterus, but to a depression of the central nervous system.

¹ Archiv f. Gynäkologie, 1914, Band ci, Heft 3.

² American Journal of Obstetrics, January, 1914.

Welz¹ reports 6 cases of pregnancy near term, treated by the injection of *fetal serum*. Labor occurred in 4, and seemed to result from the injection.

He also states his experience in the use of pituitrin in doses of 1 c.c. He believes that when these substances are used, labor is caused by anaphylactic action of proteid substances, and that the danger of anaphylactic shock must be kept in mind.

Kreiss² has used hypophysin by intravenous injection to control postpartum hemorrhage. A dose of 1 c.c. produced prompt and permanent results. Ordinarily, 0.5 c.c. was efficient in checking hemorrhage. He has also had good results with derivatives from ergot, using preparations of *secale cornutum*.

¹ American Journal of Obstetrics, July, 1913.

² Zentralblatt f. Gynäkologie, No. 3, 1914.

DISEASES OF THE NERVOUS SYSTEM.

BY WILLIAM G. SPILLER, M.D.

DISEASES OF THE BRAIN.

Brain Tumor. In my digest of last year I gave the results of Tooth's study of cases of brain tumor at the National Hospital, where the tumor was allowed to run its course without operation. He¹ reported at the International Congress the results of an analysis of 500 cases with operation at the same hospital during a period of ten years. This is a very important paper. He finds that a high general mortality exists for all operations on the brain, even in the hands of the most experienced surgeons, and that unforeseen fatal results follow even the apparently simple craniectomy of the first stage. This is more pessimism than most surgeons are willing to accept.

No one will dispute his statement that operations may be more safely performed upon some regions than upon others. The danger is least in the central region and highest in the cerebellar, especially if the tumor be in the lateral recess. These statements are different from those of Cushing, who regards cerebellar tumor more favorable for operation. The immediate dangers in all tumor operations are shock, collapse, respiratory and cardiac failure. The latter may occur any time within fourteen days, and sudden cessation of respiration may occur in cerebellar cases which appear to be doing well as late as a month after operation. Hyperpyrexia also is not uncommon, more often in cerebellar cases, but is not confined to these. A remarkable progressive rise of temperature after death is occasionally observed. Many cases have shown a remarkable and permanent recovery of vision from an acuity little more than perception of light. In several cases large infiltrating glioma did not cause optic neuritis; such tumors probably were not diagnosable when small. Growths of large size and of a low degree of malignancy have been removed and recurrence has occurred in a highly malignant form. Tooth thinks such a growth if left alone might have remained of the quiescent type for a much longer period if no more than a large craniectomy, or at most a decompression, had been done. This pessimism might lead to serious results of omission in operation if generally accepted. A few cases of glioma have been observed with survival after the operation, but the tumor

¹ Proceedings of the International Congress of Medicine, 1913, Section of Neuro-pathology.

has recurred in a more virulent form in most cases. In the case of endothelioma, recurrence is so unusual as to be almost negligible. The treatment of simple cyst is satisfactory and the result permanent, but such cysts are rare and form only 1.9 per cent. of tumors. Tooth deprecates exploring the brain by puncturing when the tumor is not visible on exposure of the brain. This seems to me like sound advice. I have seen too often serious operative damage of the brain. Surgeons may question the wisdom of leaving the dura unopened in a decompression. Tooth advises waiting to open the dura after performance of craniectomy until there is evidence that the tumor is still increasing. Most cases of intracranial tumor, he acknowledges, need operation, perhaps sooner than later, and the risk has to be taken.

Some who heard Tooth read his paper thought he was more pessimistic than facts justified. Unquestionably, the mortality from operations on brain tumor is high. Ludwig Bruns was co-reporter with Tooth at the Congress, and he stated that we may expect benefit from surgery only in 3 to 4 per cent. of all intracranial tumors.

MISTAKEN DIAGNOSIS IN BRAIN TUMOR. A mistake in the localization of a brain tumor may be made by the most experienced neurologists and may be unavoidable. A tumor of one region may cause symptoms of a growth in an entirely different part of the brain, and occasionally the cause for this can be detected. In a case studied by Higier¹ the symptoms suggested a tumor of the right cerebello-pontine angle. The general symptoms of increased intracranial pressure were present, but in addition were right-sided deafness, paresthesia of the right side of the face, right abducens and right facialis paresis with diminution of electrical irritability in the right facial nerve. All these were localizing symptoms and suggested a tumor implicating the fifth, sixth, seventh, and eighth nerves on the right side. Contradictory symptoms were left-sided amblyopia and asynergia and adiadochokinesis of the left upper limb. The *x*-rays showed a shadow above the sella turcica.

One can readily understand why Higier should feel justified in the diagnosis of tumor of the right cerebellopontine angle, and yet post-mortem examination disclosed a tumor of the third ventricle, an endothelioma psamosum, supposed to be congenital. A considerable amount of fluid escaped after the finger of the surgeon was placed in the right cerebellopontine angle. Higier believed the localizing symptoms were caused by an enlarged cisterna pontis lateralis, and were secondary to the tumor. Such a cyst is difficult to determine, as it would be destroyed in the removal of a brain at necropsy.

BRAIN TUMOR SIMULATING APOPLEXY OR HYDROCEPHALUS. Tumor seldom causes a mistaken diagnosis of apoplexy, but occasionally it

¹ *Neurologisches Centralblatt*, June 16, 1913, p. 741.

may do so. Eduard Müller¹ recorded the following interesting case: A woman, aged fifty-five years, suddenly became unconscious in the street car, was cyanosed, had slow and deep respiration, conjugate deviation of head and eyes to the right, loss of pupillary reaction, flaccidity of the limbs, etc., and died an hour and a quarter after she was brought from the street to the hospital. It is not surprising that the diagnosis of cerebral hemorrhage was made, especially as the heart, aorta, and kidneys were diseased. No hemorrhage was found, but instead a fibrogloma the size of a hazelnut was discovered on the right acoustic nerve in the cerebellopontine angle. Inquiry as to the woman's previous condition revealed some symptoms suggestive of this tumor, but it is remarkable that a tumor causing so few symptoms could bring on an apoplectic attack and death. The necropsy did not explain this. It is well known by every experienced neurologist that sudden fatal attacks like those of apoplexy are not uncommon with brain tumor, especially with those in the posterior cranial fossa.

Müller believes that the mental symptoms of tumor of the frontal lobe do not differ from those caused by brain tumor of any other location, they are not focal symptoms except that they are early symptoms of frontal-lobe lesion.

Another case with very rapid onset of symptoms is reported by F. A. Meyer.²

A boy, aged thirteen years, while exercising was said to have fallen. He was not unconscious at first, but one hour after the accident vomiting began, with severe headache and vertigo. The evening of the same day he became unconscious, and convulsions of the face, especially of the left side, developed. Attacks of unconsciousness occurred every few weeks and were associated with convulsive movements of the right upper limb or of both upper limbs at the same time. There had been no symptoms before the accident. Other signs were choked disks, increased pressure of the cerebrospinal fluid, transitory bilateral abducent paralysis, and right facial paralysis. The symptoms varied much in intensity. The necropsy revealed a cystic tumor like a bag of fluid at the base of the brain, extending into both frontal lobes especially the right, but not communicating with the ventricles. The clinical diagnosis in this case was difficult, but the case was regarded as one of internal hydrocephalus, implicating especially the left hemisphere. Even after the necropsy the symptoms could not be readily explained. It was supposed that the cystic tumor was congenital, and that, as a result of the trauma, hemorrhage occurred in the cyst and caused increase in growth of the tumor. The case illustrates in an excellent manner the difficulty that may arise in diagnosing between hydrocephalus and brain tumor.

¹ *Deutsch. Zeitschrift f. Nervenheilkunde*, vols. xlvii and xlviii, p. 388.

² *Monatsschrift f. Psychiatrie und Neurologie*, October, 1913, p. 370.

TONIC PRELIMINARY STAGE IN JACKSONIAN CONVULSIONS. In a case of Jacksonian epilepsy studied by Lewandowsky and Selberg,¹ an angioma cavernosum was found in the motor region. A pronounced tonic stage ushered in the convulsions. Some neurologists (Ziehen, Binswanger) assert that the clonic convulsions depend on cortical irritation, the tonic on subcortical irritation, *i. e.*, in the brain stem. Lewandowsky has disputed the correctness of this view, as he believes both forms of movement are cortical in origin. It has been supposed that the Jacksonian attack begins with clonic movements, and the general convulsion with tonic movements, and yet certain important writers on epilepsy do not teach this. Lewandowsky and Selberg previously had always observed clonic movements ushering in the Jacksonian convulsion, therefore, they regard the prolonged primary tonic stage, in the case they now report, as exceptional. The finding of a cortical lesion in this case and absence of any lesion in the brain stem show that the tonic spasm is also of cortical origin.

IMPROVEMENT IN BRAIN TUMOR. Improvement in cases of brain tumor may be brought about in various ways, as by antisiphilitic treatment, arrest of the growth, degeneration of the tumor, thrombosis in aneurysm, calcification of tubercles and other growths, and escape of cerebrospinal fluid through the nose in tumors with hydrocephalus. In some cases of supposed tumor with disappearance of symptoms, necropsy has shown that a condition other than tumor has existed; such a case has recently been reported by Redlich.² The symptoms began with mental disturbance, and soon the clinical picture of brain tumor was presented, as shown by headache, percussion tenderness of the head, choked disks, and vomiting. Focal symptoms were left hemiplegia, hemianesthesia and hemianopsia and right abducent nerve palsy. Much temporary improvement was obtained by iodides. A focus of what seemed to be softening was found in the right cerebral hemisphere, and when this was studied microscopically it showed a peculiar form of glioma tissue that was difficult to classify.

A case studied by Sicard³ offers certain features of great interest and shows *improvement from lumbar puncture*. The patient had been under his care four years with typical symptoms of brain tumor, but the location of the growth could not be determined. Antisiphilitic treatment had been of no benefit. Decompression was feared by the friends of the patient, and laminectomy of the eleventh thoracic to the third lumbar vertebra inclusive was performed on account of transitory crises of pain in the lower limbs. This operation caused a diminution in the intensity of the headache and in the swelling of the optic disks, and disappearance of pain in the lower limbs. Two months later,

¹ Zeitschrift f. die gesamte Neurologie und Psychiatrie, vol. xix, No. 3, p. 336.

² Jahrbücher f. Psychiatrie und Neurologie, vol. xxxiv, No. 1.

³ Revue Neurologique, March 30, 1914, p. 451.

symptoms of increased intracranial pressure became so pronounced that decompression without opening the dura was done. Improvement occurred rapidly but a meningocele formed, and, in order to prevent rupture of this, it was necessary to do lumbar puncture daily for about six months with removal of 120 to 150 c.c. of fluid. Later, the puncture was done weekly. The patient begged for the puncture as the headache became worse and the gait more ataxic when the meningocele was tense. Relief was always obtained immediately by lumbar puncture. It was not thought advisable to puncture the meningocele for fear of a persistent fistula and infection. Under this treatment, the patient recovered normal vision, choked disks disappeared and the headache became slight. Sicard began to doubt the correctness of the diagnosis of tumor, and suspected ependymitis or chronic plexochoroiditis with hypersecretion of the cerebrospinal fluid.

NECROSIS OF BRAIN TUMOR FOLLOWING DECOMPRESSION. One cannot deny that decompression possibly may cause a brain tumor to degenerate and even disappear, but the literature on the subject is not convincing, and the possibility of this occurrence is far from proved by such a case as that E. Röper¹ offers as evidence. His patient presented symptoms of tumor, not discovered at an operation, fourteen years before a necropsy revealed it as a small fibroma associated with two small cysts. Röper rejects the suggestion that arteriosclerotic softening may have been followed by tumor formation, because there was no general thickening of the vessels of the brain at the necropsy and the history contained no statement of sudden onset. He rejects also the possibility of cerebral embolism as the initial lesion. He thinks it probable that the fibroma existed long before the patient came under medical observation, and, as it increased in size, it caused signs of intracranial pressure with internal hydrocephalus, probably especially of the posterior horn of the left lateral ventricle. The decompression and puncturing changed the mechanical condition and nutrition of the tumor, and led to softening and cystic formation. All this is very pretty as theory, and may be possible, but how far it is from being positive evidence of necrosis of a tumor following relief of pressure!

TONIC PERSEVERATION IN BRAIN TUMOR. Tonic perseveration has been observed by S. A. K. Wilson² in three cases; in two of these the lesion was a cerebral tumor. The phenomenon consisted in inability to relax a given innervation; thus when the patient, for instance, was asked to grasp the observer's fingers for five seconds, he might be unable to relax the innervation for so long as two or even three minutes, and it frequently happened that when the patient was asked to let go his grasp perceptibly tightened. Two of these cases did not present

¹ *Monatsschrift f. Psychiatric und Neurologie*, November, 1913, p. 470.

² *Transactions of the Section of Neuropathology, XVIIth International Congress of Medicine*.

any apraxia in the ordinary sense and very fair attempts were made to perform such movements as were required by the examiner. The third case presented the combination of tonic perseveration of the left limbs with complete motor apraxia of the same. Wilson considered the phenomenon closely allied to motor apraxia though not identical with it, and it might occur by itself.

Foerster said he had observed tonic perseveration in five cases of motor apraxia. Three were cases of tumor of the brain. Two were cases of arteriosclerosis.

MACROPSIA FROM BRAIN TUMOR. A very unusual symptom of tumor of the occipital lobe, macropsia, has been observed by Josefson.¹ The patient saw all objects enlarged; the room appeared "so large," the physician tall, his face large. This symptom Josefson was unable to find mentioned in any recorded case, although Oppenheim observed micropsia with brain tumor. In Josefson's case, macropsia was associated with visual hallucinations. Macropsia or micropsia is not very rare in the epileptic aura.

TUMORS OF THE OPTIC THALAMUS AND CORPORA QUADRIGEMINA. Two extraordinary cases of extirpation of brain tumor are reported by Oppenheim and Krause.² In the first case an incision was made in the first temporal convolution, and the first two fingers of the surgeon were inserted in this incision to a depth of 8 cm. A mass measuring 8 cm. x 6 cm. x 5.5 cm. was removed, apparently without opening the ventricle. The tumor was supposed to have been removed from the optic thalamus. With the exception of a similar case reported by Balance, this is the only case of removal of a tumor of the optic thalamus. Was it worth while? Improvement was slow and progressive, but the condition remained serious. It is the chief duty of the physician, according to these authors, to preserve life, especially as it is uncertain how far restitution may be accomplished by operation. This statement raises one of the most difficult questions a physician may have to answer. An operation such as was performed in this case may be fatal or may make the general condition more severe; it cannot be expected to restore the patient to health. Is it the physician's duty to prolong a life which he, by the method used to prolong life, may make undesirable or even unbearable?

The second case was equally remarkable. A tumor of the corpora quadrigemina was removed and the improvement seems to have been pronounced. There is opportunity for really successful removal of a tumor in this region, but the operation is an extremely difficult one.

PITUITARY TUMORS. Cushing³ has studied the changes in the visual fields occurring with pituitary tumor. Bitemporal hemianopsia is

¹ Deutsch. Zeitschrift f. Nervenheilkunde, vol. xlix, Nos. 4 and 6, p. 341.

² Berliner klin. Wochenschrift, December 15, 1913, p. 2316.

³ Journal of Nervous and Mental Disease, December, 1913, p. 793.

not always present, as the tumor may affect one optic tract. In the majority of instances the defect advances in very characteristic fashion, usually beginning in the upper and outer temporal field and affecting color vision before vision for form. These minor changes are as characteristic of a retrochiasmal lesion as is the full-blown text-book picture of complete bitemporal hemianopsia. The defect rarely advances with equal steps in the two eyes, and consequently for each individual eye it proves to be a matter of clinical convenience to divide the advancing process into stages, as follows:

Stage 1. Shows merely a notch, often quadrantal, in the upper temporal field for color, though there may be, in addition, some slanting off of the form field. This is owing to the fact that the ventral crossed fasciculus is affected by the pressure at an earlier stage than is the dorsal crossed fasciculus, the transmission of color impulses being affected earlier than the transmission of form impulses.

Stage 2. In this stage a beginning quadrantal constriction in the form field follows the quadrantal defect for colors.

Stage 3. Here color vision is more or less completely lost in the entire temporal field, the form constriction remaining practically quadrantal, with beginning encroachment upon the lower temporal field.

Stage 4. In this stage hemianopsia is complete for form and colors, the macula still being spared by the otherwise practically vertical meridian.

Stage 5. Hemianopsia remains complete for form and color, the macula now being included in the vertical meridian, there being in this stage often an actual complete macular blindness for colors.

Stage 6. Macular vision is lost for form as well as colors and the nasal field begins to shrink from the vertical meridian.

Stage 7. Color vision is entirely lost but a patch of vision for large objects remains, usually in the lower nasal quadrant.

Stage 8. Blindness.

The least affected eye progresses in the meantime along the same route; but the process rarely advances with equal step in the two eyes. One eye may be completely blind, whereas the other may show a condition in Stage 1, or may be with no observable change.

Even after Stage 8 with blindness has been reached, some vision may be regained by operation; which shows that the disturbance is brought about not only by anatomical destruction of the fibers through degeneration, but also by a physiological block to the transmission of impulses superimposed on the actual atrophic changes.

A serious complication of pituitary disease is primary optic atrophy. This, Cushing thinks, is in many respects the most obvious of the neighborhood symptoms and one for which surgical measures are as definitely indicated as when dyspnea is produced by pressure against the trachea in cases of goitrous enlargement of the thyroid gland.

Glycosuria with Pituitary Tumor. Diabetes with acromegaly is regarded as of rather frequent occurrence, but glycosuria without acromegaly is more rarely produced by a tumor of the pituitary body, and, according to Sainton and Rol,¹ no case had been reported before theirs in which diabetes had occurred having the rapid course of juvenile diabetes from pituitary tumor. These authors show that diabetes may be the most important sign of pituitary tumor and mask the other signs. In their case, headache and somnolence were attributed to the diabetes, but slowness of speech, bitemporal hemianopsia, etc., gave the clue later to the correct diagnosis. There can now be little doubt that pituitary lesion may cause glycosuria, and it is important to recognize that this glycosuria may be the predominating symptom; whether this would indicate, however, that only the posterior lobe is affected seems undetermined.

REMOVAL OF CYST OF THE PINEAL GLAND. The first case of operation on a new growth of the pineal gland is reported by Pussep,² and it is much to be regretted that the operation was unsuccessful. The diagnosis seems difficult. A boy, aged ten years, complained of headache, and then difficulty in vision was observed, inasmuch as he turned the head several times before he fixed an object with his eyes. A slight impairment of hearing was detected, and the gait became ataxic. Later, sight became impaired, then the right lower limb lost some power and tremor developed in both lower limbs in walking. Then all four limbs became weaker and tremor was seen in the upper limbs when those were moved. The child was confined to bed and vomited frequently, and the headache became severe. The tendon reflexes of all four limbs were exaggerated and the Babinski sign was positive. The diagnosis of tumor of the corpora quadrigemina or of the pineal gland was made, although all signs of disturbance in the sexual organs, as unusual development of these organs, were wanting. The pineal tumor was considered probable because the symptoms at first seemed to indicate pressure upon the corpora quadrigemina and, later, implication of the oculomotor nuclei, of the cerebellum and cerebral peduncles.

An operation was followed by death in three days. A cyst of cherry size was found in the pineal gland pressing upon the middle lobe of the cerebellum and extending partially into the third ventricle. A growth of this kind is likely to cause internal hydrocephalus, and this internal pressure, when the external pressure is removed, may cause the tumor to protrude and render the operation less difficult. Pussep thinks his case shows that tumors of the pineal gland may be removed by the surgeon.

TUMOR OF THE GASSERIAN GANGLION. It may be impossible in the onset of symptoms to distinguish a tumor of the Gasserian ganglion

¹ *Revue Neurologique*, June 30, 1913, p. 785.

² *Neurologisches Centralblatt*, May 1, 1914, p. 539.

from *tic douloureux*, because pain may be the only indication. Pain commencing simultaneously in all three branches is always a suspicious symptom, because in *tic douloureux* the pain is seldom in all three branches from the beginning. Still, in tumor cases one branch of the fifth nerve may escape, at least for a time, as in the case studied by Sachs and Berg.¹ In their patient the second branch was the seat of the most intense pain, although the first and third did not entirely escape. Paroxysms of pain did not occur and the pain was not made worse by cold or by chewing, as it frequently is in *tic douloureux*. Pus in the antrum was found and removed, and, as antrum disease often causes trigeminal pain, it was supposed the cause had been removed, but contrary to expectation the pain persisted. The pain began in January, 1912, and in September of the same year, Sachs discovered a slight diminution of objective sensation in the distribution of the second branch. I have studied five cases of tumor of the Gasserian ganglion and have come to regard hypesthesia in the painful area as very suggestive of tumor of the ganglion, it is a *paraplegia dolorosa* in sensory fibers. Finally, atrophy of the masseter and temporal muscles was detected. Operation was now determined upon and performed by Berg. A round tumor was found in the region of the ganglion, although nothing could be seen of the ganglion, and the entire tumor was removed. It was found to be an endothelioma. The operation was performed December 30, 1912, and the patient seems to have been seen last in March, 1913, three months after the removal, and his condition was very satisfactory.

Speech Centres in the Right Cerebral Hemisphere in Right-handed People. In a case reported by Heinrich Bickel,² a tumor was found in the left frontal lobe; it had pushed upward and flattened Broca's area and pressed upon the first temporal convolution. Distinct aphasia had not occurred although the man was right-handed. The speech was slow and somewhat indistinct, and occasionally there was difficulty in finding a word. Similar cases have been recorded by v. Monakow, Liepmann, and others. The explanation offered for this failure of correspondence between symptoms and the lesion is that a slowly growing tumor gives time for the assumption of function by the sound cerebral hemisphere; but this explanation does not apply when the lesion develops acutely. It is possible that the speech centres are not always in the left cerebral hemisphere. Cases are on record in which the speech centres in right-handed people evidently were in the right cerebral hemisphere. Such a case is recorded by Kurt Mendel.³ A right-handed woman suddenly became paralyzed on the entire left side and had complete motor aphasia, and an embolus was found in the right Sylvian artery which had caused softening of the right third

¹ Berliner klin. Wochenschrift, 1913, No. 30, p. 1395.

² Neurologisches Centralblatt, March 1, 1914, p. 287.

³ Ibid., p. 291

frontal and first temporal convolutions. The left cerebral hemisphere was intact. The microscopic examination of this brain was very important, as a lesion of the left cerebral hemisphere might have been overlooked. The brain was cut in serial sections in Vogt's laboratory in Berlin, and the left cerebral hemisphere was found intact. The case is one of the most important in literature, and demonstrates that the motor speech area may be in the right hemisphere even in a right-handed person. This woman could write and understand spoken words. I have referred to this case in my digest in *PROGRESSIVE MEDICINE* in 1912, but at that time the microscopic examination had not been made.

Function of the Cerebrum in the Newborn. To what extent a human being is capable of function without a cerebrum is a question that has not been satisfactorily answered until the present. Goltz's dog, from which the cerebrum had been removed, was of great importance in physiology, and later Rothmann removed the cerebrum of a dog and kept his dog living longer, confirming Goltz's results. Children have been born without a cerebrum but lived only a few days. They were able to move the limbs, suck, cry, close the eyelids and show certain emotional movements, in short, to accomplish about all that normal babies can, so that the cerebrum would appear to have little function in the newborn. The medullation of this part of the brain is very imperfect at birth. Edinger and Fischer¹ have studied a case in which life was prolonged into the fourth year although the cerebrum was only a thin membrane. The microscopic sections resembled closely those from Goltz's dog. The physical condition of this child is described by the mother who is said to be a very intelligent woman. The child took the breast soon after birth, but was awake only when sucking, it never cried during the first year, but occasionally made a slight noise, and never gave any sign of hunger. The parents observed in the fourth week that all the limbs were stiff, and the child did not move its body during the first year. It took the bottle at the fourth month and sucked it when it contained milk, but not when it contained water, so that it must have had some function of taste. Unless it were awakened and fed it showed no desire for nourishment. It showed no recognition of its mother by voice or vision, and from tests employed it appeared to be blind, although it closed the eyelids in a strong light. A very loud noise would cause it to start, but otherwise it gave no sign of hearing. Pinching the ends of the fingers gave no evidence of discomfort, but rubbing the head would stop it from crying, as would also holding the child tightly against the mother's body. It cried almost continuously from its second year to the end of its life, and never smiled. The teeth began to grow at the fourth month. The child lived in this condition until three and three-quarter years old and died from inanition.

¹ Archiv f. die gesamte Physiologie, vol. clii.

Bulbar Paralysis in Typhoid Fever. Fitz, Brigham and Minot¹ have reported a case of bulbar palsy probably typhoidal in origin. A man, previously in good health, was seized suddenly with fever accompanied by difficulty in swallowing and weakness of the legs. He died eight days after the onset of his illness with symptoms suggesting bulbar paralysis and an increasing paralysis of areas supplied by spinal as well as cranial nerves. The course of the paralysis was not typically ascending or descending, but diffuse, suggesting a rapid involvement of one nerve area after another. Necropsy revealed no cause for the paralysis but gave the intestinal lesions of typhoid. Similar cases are cited from the literature. These authors believe acute bulbar paralysis is a rare complication of typhoid fever. The symptoms, they say, usually suggest at the onset an acute ascending paralysis, developing either at the height of the disease or after convalescence has begun and ending with evidence of bulbar involvement. Recovery may take place after a prolonged illness or death may occur within a few hours. This clinical picture may exist without evident tissue change in the nervous system or may be caused by peripheral nerve lesions, or by hemorrhagic encephalitis analogous to that found in other forms of infection, or, finally, by the presence of organisms in the brain. I think more attention should be paid to the possibility of thrombotic lesions as a cause. In rare instances thrombosis is a cause of hemiplegia in typhoid, and bilateral symptoms might be caused by thrombosis of the medulla oblongata or spinal cord.

Infantile Pseudobulbar Paralysis is very rare and Peritz could find only three cases without implication of the limbs, although he wrote a monograph on bulbar and pseudobulbar paralysis of childhood. Another clinical case is now recorded by Gans.² The paralysis seems to have had its origin in his case in some disorder developing at the sixth month of life.

Fickler³ has had three cases of pseudobulbar paralysis in children without paralysis of the limbs. In these, epileptiform attacks and idiocy, congenital or acquired very early, were associated with paralysis in the distribution of certain cranial nerves, such as occurs in bulbar palsy. Unlike what is seen in this condition were the absence of muscular atrophy and reaction of degeneration and the movement possible in the affected muscles in emotional states and swallowing. The lesion, therefore, could not be in the medulla oblongata but must be higher. The convulsions and idiocy suggested the cortex, and the small skull in all three cases seemed to indicate maldevelopment of the brain. There was slight implication of the forehead and ocular muscles, and in all three cases the Wassermann reaction in the serum was positive, the cases, therefore, were syphilitic.

¹ Boston Medical and Surgical Journal, June 26, 1913.

² Zeitschrift f. die gesamte Neurologie und Psychiatrie, vol. xix, No. 3, p. 330.

³ Deutsch. Zeitschrift f. Nervenheilkunde, vols. xlvii and xlviii, p. 117.

The Atonic Atasic Type of Infantile Cerebral Paralysis. Under this designation, Otfrid Foerster,¹ in 1909, described a condition of cerebral diplegia with general hypotonia of muscles. His paper has not received the recognition it deserves, but the disorder has been referred to by L. Pierce Clark,² with some excellent illustrative cases. His description conforms closely to that given by Foerster, and is as follows: Nothing abnormal in physical and mental make-up usually is noticed for the first few months after birth. When the child is a year or eighteen months of age, it is noticed to be unable to sit up or hold up its head or to stand. The motility of all the limbs is normal. The child lies on its back with the lower extremities bent considerably at the knees and hips, and strongly abducted and rotated outwardly. The legs can be easily extended. The whole musculature of the body is relaxed. There is no atrophy and none develops later. The electrical irritability is normal. The most striking symptom is the greatly exaggerated mobility of the joints. So far, the condition resembles closely amyotonia congenita. The positions in which the limbs of the child can be placed recall those assumed by contortionists. In later years, as the child grows, ataxia of cerebellar type is superadded and incoördination of all the extremities is marked whenever the child attempts to stand or walk. The patellar reflexes may be increased, diminished or lost. Ankle clonus is absent, and the Babinski reflex may, or may not, be present. The mental defect usually amounts to idiocy or a low degree of imbecility, and changes little with advancing years. There is always a marked speech defect, usually amounting to mutism, or a few words may be spoken. There has been no necropsy in a typical case of this disorder.

Early Cerebral Syphilis. Syphilis of the nervous system occurring six months after the initial lesion is the subject of a paper by Gregory and Karpas.³ They refer to reported cases in which this condition developed one and a half months to one and a half years after the appearance of the initial lesion. Nauyn demonstrated that, in 48 per cent. of 335 cases, cerebral manifestations developed during the third year, and from that time the frequency of cerebral syphilis gradually and proportionally diminished from year to year. Gregory and Karpas' patient was a man who six months after contracting syphilis developed right-sided hemiplegia and motor aphasia. Marked improvement resulted under antiluetic remedies.

Occlusion of vessels of the brain and cord causes different symptom-complexes according to the vessels occluded. I⁴ have described several new complexes produced in this way and the most recent is occlusion

¹ Deutsch. Archiv f. klinische Medizin, vol. xcvi, p. 216.

² American Journal of Diseases of Children, June, 1913, p. 425.

³ Review of Neurology and Psychiatry, 1913, p. 257.

⁴ Le Névrose, 1913, vol. xiv.

of the vessels supplying the oculomotor nuclei. The symptoms of this are involuntary incoördinate movements, great rigidity of all the extremities, unconsciousness, and oculomotor palsy. All the symptoms except the last may disappear. Syphilis is the great cause of vascular occlusion.

Hydrocephalus. Dandy and Blackfan¹ have performed experiments on dogs for the production of hydrocephalus and they conclude that two types of this condition may be recognized. In the first type, after the injection of phenolsulphonaphthalene into the ventricles, the time of its appearance in the urine is greatly delayed (from twenty to forty-five minutes) and the quantity excreted in two hours is practically negligible (from 0.25 to 1 per cent.). The excretion of phenolsulphonaphthalene in this group after its injection into the subarachnoid space is practically normal (time of appearance from six to eight minutes, quantity excreted in two hours from 35 to 60 per cent.). After the injection of phenolsulphonaphthalene into the ventricles, it has not, in the cases observed, appeared in the spinal fluid. In this group they found, at necropsy, an obstruction to the passage of cerebrospinal fluid from the ventricles to the subarachnoid space. In two cases there was a congenital closure of the aqueduct of Sylvius, a third showed old adhesions obliterating the basal foramina of Magendie and Luschka, and in the fourth these foramina were closed by a thick tuberculous exudate which completely covered the base of the brain.

In the second type the excretion of phenolsulphonaphthalene after its injection into the subarachnoid space is greatly diminished (from 8 to 15 per cent.), and the appearance time delayed (from twenty to thirty minutes). The amount excreted after its injection into the ventricles likewise is greatly diminished, on account of low subarachnoid absorption. In contradistinction to the first type, the communication between the ventricles and the subarachnoid space is open. This is shown by the prompt (from two to three minutes) appearance in the spinal fluid of phenolsulphonaphthalene after its injection into the ventricles. In this type, hydrocephalus is caused by diminished absorption from the subarachnoid space.

Cerebellar Localization. The inability of a person with cerebellar disease to return the finger to a point from which it has been moved has been called by Barany, *Vorbeizeigen*. The variation is always in the same direction from the same lesion, and may be produced not only by a lesion of the cerebellum but also by syringing the ear with warm or cold water or by revolving a person in a chair. Rothmann² has studied this finger deviation in cerebral lesions, and raises the question whether it is a focal sign or is a remote effect upon the cerebellum. He inclines to the view that it may be directly from the cerebral lesion:

¹ Journal of the American Medical Association, December 20, 1913, p. 2216.

² Neurologisches Centralblatt, January 2, 1914, pp. 3 and 71.

this Sewandowsky does not readily accept. Rothmann concludes that the Barany finger test is much more complicated than it appeared at first. It is important in cerebellar lesions, but only in association with other symptoms; it may be absent in cerebellar disorders when another part of the cerebellum or even the cerebrum assumes the function of the destroyed area, or it may be evident when the cerebellum is intact. It may indicate a cerebral lesion, and occasionally may be the only sign of such a lesion. Barany's test affords a new method of investigation and deserves further study.

Apoplexy. Cadwalader¹ has studied 72 cases of cerebral hemorrhage and 50 of softening with necropsy in order to ascertain to what extent differences in the character of an attack can be relied on for diagnostic purposes; he has studied also the histories of more than 300 non-fatal cases of hemiplegia in which an acute vascular lesion had undoubtedly been the initial source of paralysis, but only 100 of these were found satisfactory for analysis. On account of the fact that so many patients with apoplexy are not observed during the beginning of the attack, many being picked up on the street and brought to the hospital in an unconscious state, the difficulty of obtaining an accurate history is very great, therefore only 38 cases of hemorrhage and 24 of softening were made use of, for the accuracy of the statements obtained seemed to be beyond all possible doubt. I cannot refer to this valuable paper as fully as it merits, or I should be obliged to repeat it almost word for word. Cadwalader concludes that generalizations are dangerous as exceptions always occur, but he believes spontaneous intracerebral hemorrhages are likely to be large and that very small hemorrhages are rare. Of 72 specimens of hemorrhage examined, only 4 measured less than 4 cm. in their broadest diameter. It is certain that large hemorrhages are always fatal, and it is also certain that small hemorrhages may be fatal, and it even seems probable that hemorrhages are always fatal, no matter whether small or large.

When repeated attacks of apoplexy with hemiplegia occur in the same patient at different times, the final or fatal attack may be caused either by softening or hemorrhage, but the former non-fatal attack is invariably caused by vascular obstruction and softening, and not by hemorrhage. Repeated attacks of intracerebral hemorrhage are not compatible with life.

Small and moderate sized lesions within the brain, generally described as cysts, are likely to be considered the result of vascular occlusion; but in some instances such lesions may be produced by hemorrhage which has not terminated fatally.

The duration of life is generally longer with small hemorrhages than with large ones. Sudden death within a few minutes after the

¹ Journal of the American Medical Association, May 2, 1914, p. 1385.

onset of apoplexy does not occur, even though the lesion be a large one. Fairly large hemorrhages do not in all instances cause rapid death.

The type of apoplexy produced by hemorrhage and by vascular obstruction is not of a distinctive kind. The onset and character of the apoplexy may be exactly alike, though the lesion be entirely different. A sudden onset with rapidly developing and persistent coma usually indicates hemorrhage. A slow onset with premonitory symptoms without profound coma may be caused by hemorrhage or softening, but the less severe the disturbance of consciousness, the more likely that it is caused by softening and not by hemorrhage.

Premonitory symptoms are not characteristic of the lesion; as a general rule, they are recorded in the milder types of apoplexy in which the onset is not abrupt.

Slowly increasing loss of consciousness ending in profound coma, known as *ingravescent apoplexy*, usually is caused by hemorrhage.

It is doubtful whether hemorrhage ever occurs without causing very distinct disturbance of consciousness, but it is certain that many softenings do occur without producing distinct apoplectic attacks. Most non-fatal cases of hemiplegia are caused by vascular occlusion and subsequent softening. The mere fact that life is preserved is in itself indicative of some other lesion than hemorrhage.

The type of apoplexy probably depends more on the size of the hemorrhage than its situation, but with softening the rapidity with which the vessel is occluded may influence the rapidity of onset of the attack as well as the extent of the lesion.

Decompression in Cerebral Hemorrhage. Pierre Marie¹ believes that clinical observations and a study of the lesions justify the conclusion that coma in cerebral hemorrhage is caused more by compression of the brain than by the sudden formation of a clot within a cerebral hemisphere. The sudden outflow of blood causes the stroke, which is transitory, but the compression causes the coma, which is persistent, and persistent coma occurs only when the sound hemisphere also is compressed. Marie has found that a large hemorrhage 5 or 6 cm. in length and 3 or 4 cm. in width not compressing the cerebral hemisphere opposite to that in which the clot forms does not cause coma. The persistence of the function of one hemisphere is sufficient to preserve consciousness. Inflammatory edema may be the cause of late compression of the sound hemisphere and this compression may be recognized at autopsy by the flattening from contact with the skull. Decompressive trephining over the sound hemisphere should be done in suitable cases, but not over the seat of hemorrhage, as this might increase the hemorrhage from rupture of the brain tissue relieved of

¹ Bulletin de l'Académie de Médecine, Séance du 18 Novembre, 1913.

the support of bone. In operating over the sound hemisphere, the danger is reduced to the minimum, the blood is not likely to escape into the meninges, and the relief of compression of the sound hemisphere is obtained. Operation should not be done in every case; the age should not be very advanced, severe nephritis is a contra-indication, the temperature should not be high, and very early coma indicates too great compression to be relieved.

In a discussion on a paper on decompression for traumatic intracranial hemorrhage read by L. Bathe Rawlings at a meeting of the Medical Society of London, C. A. Ballance¹ said he thought the time was not far off when all varieties of intracranial hemorrhage would be considered as clearly surgical as were other forms of hemorrhage. In regard to apoplexy, the chief difficulty in the study by operation of these cases is that acute apoplexy is seldom seen in hospital practice, and in operations for chronic apoplexy the best results cannot be obtained. He urged that operation should be regarded as the rational treatment, especially in fracture of the base of the skull and in acute apoplexy. Ferrier, speaking as a clinician in this discussion, said there were still many questions to be answered in regard to decompression in apoplexy, but unfortunately his remarks are quoted very briefly. What are suitable cases? How long should one wait? Are there any great risks from damage to the brain? He remarked that there are many things other than pressure to be considered in such cases. Might not another burst of hemorrhage be produced by the operation? He said he would be very guarded in recommending operation for spontaneous apoplexy.

Spontaneous Subarachnoid Hemorrhage. Spontaneous hemorrhage of the subarachnoid space of the brain or cord is a condition seldom diagnosed clinically and seldom seen at the necropsy table, but Forsheim² thinks it is not so uncommon as is usually believed. Cases are not included under this heading in which hemorrhage was caused by trauma or by inflammation, tumors, aneurysms, etc. The symptoms of spontaneous subarachnoid hemorrhage vary greatly according to origin, intensity and extent of the hemorrhage. They may be those of rapidly developing cerebrospinal meningitis with or without an apoplectic onset, or they may be those of suddenly developing coma ending in death or yielding to the symptoms of meningitis. Forsheim reports a clinical case with severe occipital headache, rigidity of neck, tenderness over cervical vertebrae, and Kernig's and Lasègue's sign, indicating meningeal irritation. Meningitis was excluded because of apoplectic onset in good health and with as great intensity of symptoms in the onset as later, and the diagnosis of subarachnoid hemorrhage was made by Petrén. Cerebrospinal fluid obtained by lumbar

¹ *Lancet*, February 21, 1911, p. 536.

² *Deutsch. Zeitschrift f. Nervenheilkunde*, vol. xlix, Nos. 1 and 2, p. 123.

puncture had a reddish color, not believed to be from puncture of a vessel by the needle, because the admixture of blood was as great at the end of the tapping as at the beginning and no coagulation occurred.

Lumbar puncture is of therapeutic value in these hemorrhages and should be repeated until the pressure of the cerebrospinal fluid becomes normal. It should never be allowed to fall below the normal or there would be danger of further hemorrhage. The patient should rest in bed after the puncture until serious effects of the puncture have disappeared. Unless death occurs from subarachnoid hemorrhage, recovery is likely to be complete.

Pseudoparalytic Muscular Rigidity of the Waking State. An important contribution to lesions of the lenticular nucleus is furnished by Serge Davidenkof,¹ although the diagnosis of lenticular lesion in his case is based only on clinical observation. The condition developed suddenly. A boy, aged fifteen years, previously healthy, fell suddenly in the street; the head and eyes were turned to the right, he was unconscious, and for six weeks had vomiting and convulsions. After three months he remained almost completely paralyzed during the day, but for ten to twenty minutes after awakening he was able to move, to sit down, to walk, and to speak. It is this extraordinary daily loss of function so shortly after awakening which makes the case noteworthy. The boy became almost immobile, unable to sit down, to speak, to grasp any object, and, of all his voluntary muscles, only the external ocular muscles retained function and these moved normally. The face was immobile, the mouth was partly opened, and the saliva dribbled. When he was told to close the eyelids he did so after a little time, but was unable to keep them shut and soon opened them. The reflex closure of the lids from touching the cornea was well performed. Movements of the mouth on command were almost impossible, he made slow and incoördinate attempts at closing the mouth, but could never press the lips together nor show the teeth. He could smile, and the smile was excessive and this was the only emotional movement of which he was capable. He could protrude the tongue as far as the teeth. He was scarcely able to make a sound when he attempted to speak, and the vocal cords were in the cadaveric position and did not change in any attempt at speaking. Swallowing was feeble and slow, but was possible if some one pushed the food beyond the soft palate. When seated in a chair, the trunk and head were much arched forward, and when his equilibrium was lost he fell backward, maintaining the attitude of a person sitting. He was able to stand erect and to take short steps, and at times showed propulsion. The gait was spastic and all the muscles were rigid as in paralysis agitans. If the limbs were placed

¹ L'Encephale, September 10, 1913, p. 200.

in different positions, he could show much power in resisting any change of position, and yet very little force was necessary on the part of the examiner to prevent active movement. The contrast presented by this patient immediately after awakening, provided the sleep was sufficiently long, was striking. He was able then to sit down or stand up easily, to speak quickly, eat without difficulty, write, grasp objects, etc. The mental state did not appear to be impaired. In the condition of pseudoparalysis, his only means of showing that he understood was by turning his eyes to the right, as this movement had been agreed upon as an affirmative answer.

The author compares this extraordinary symptom-complex with that described by S. A. K. Wilson and places the lesion in the basal ganglia, especially the lenticular nuclei. The periodicity in the symptoms showed that the lesion could not be degeneration in the lenticular nuclei, and the author explains the paralyzes as great exhaustion of the part of the brain in question. He gives the complex the name of "*rigidité musculaire pseudoparalysante de l'état de veille*" and regards it as a special and poorly understood form of Wilson's lenticular syndrome. I have described the latter in my chapters of 1912 and 1913, in *PROGRESSIVE MEDICINE*.

Segmental Representation of the Limbs in the Cerebral Cortex. Reich¹ attempts to prove that Munk's view regarding the segmental representation of movement in the cerebral cortex applies to man. The individual portions of a limb are represented separately within the chief motor centres, and these subcentres have a definite arrangement. Reich reports cases in which only a small portion of a limb was paralyzed by a small cortical lesion. A few others have preceded him in teaching this view. The importance of it is very great, because it demonstrates that the opposite teaching is incorrect, *viz.*, that a limb has a general representation in the cortex, and, when paralyzed, the distal part is always the most affected.

It is generally believed by neurologists that in hemiplegia the distal portions of the affected limbs are the more paralyzed, but Bonhöffer's statement cannot be accepted, *viz.*, that cortical monoplegia never occurs in which the shoulder girdle or the elbow is paralyzed and the hand escapes. Söderbergh² contributes an interesting paper to the monoplegia with greater implication of the proximal part of the limb and reports five cases. Either there was complete loss of movement of the shoulder with intact finger movements, or weakness of the shoulder movements with intact finger and hand movements, or complete paralysis of shoulder movement with weakness of finger movements, or paralysis of the entire upper limb except that there was flexion and extension at the elbow and hand with less finger involve-

¹ Deutsch. Zeitschrift f. Nervenheilkunde, vol. xlv, No. 6, p. 446.

² Ibid., vol. xlix, No. 3, p. 253.

ment. Thus it is evident that a limb has a cortical representation according to its segments.

Sensory Localization. Much is being learned concerning the localization of sensation in the brain and a distinct step forward has been made by van Valkenburg.¹ He has followed in the wake of Cushing, and in two cases has made an osteoplastic flap in the head. Later, he has opened the dura under local anesthesia and irritated the postcentral convolution by electricity to determine the sensory disturbances produced by irritation of different parts of this convolution. He believes he has demonstrated a close connection between motor and sensory centers in the precentral and postcentral convolutions, in that the motor centres in the former convolution are represented by corresponding sensory centres in the latter convolution at the same level. This is an exceedingly important finding in its physiological bearings, and indicates that each part of the body has a distinct sensory representation in the cortex, and that these sensory centres are situated near the cortical motor areas.

Sensory Disturbances of Thalamic Lesions. Head and Holmes,² in their comprehensive study of disturbances of sensation, have devoted much attention to thalamic lesions, and, at the recent International Medical Congress, Holmes discussed this subject. Pain is common and may be excited or increased by various external influences, and especially by such that produce discomfort in normal persons. Handling or pressing on the limb or the application of heat or cold may evoke severe attacks of pain which persist for a considerable time. Cold probably is the most common exciting cause. Holmes states that outdoor patients suffer more constantly and more severely in winter than in warm weather, and many find they can avoid much discomfort by clothing themselves warmly. Many patients state that they are unable, without great discomfort, to wash the affected side in cold water, and frequently Holmes has observed that if a thalamic patient on leaving bed placed the affected foot on the cold floor he might have an attack of severe pain in the foot and leg, and even throughout the affected side of the body. When one remembers that the lesion causing this disturbance is in the optic thalamus and remote from the site of irritation at the surface of the body, the phenomena Holmes records are truly remarkable.

There is frequently a great loss of sensation in thalamic lesions, and repeated pricking and relatively heavy pressure may evoke no sensation. In such cases, overreaction can be demonstrated only to such stimuli as can produce sensations; cold, as from ice, may cause pain

¹ *Zeitschrift f. die gesamte Neurologie und Psychiatrie*, vol. xxiv, Nos. 2 and 3, p. 294.

² *Transactions of the Section of Neuropathology, XVIIth International Congress of Medicine.*

and discomfort greater than that which the same stimulus produces on the normal side. There may be such serious loss of sensibility that heavy contacts or even pressure may evoke no sensations and yet the patient may react vigorously to, and complain of pain evoked by, repeatedly drawing a wisp of wool over the hair-clad portions of the affected parts.

It is not only to somatic sensory stimuli that these patients may present this extraordinary overreaction. Head and Holmes had a patient in whom loud sounds produced great distress, and enormously increased the involuntary movements of the affected arm. During a railway journey this patient found the noise so intolerable that he attempted to throw himself from the train. Pain and discomfort may be induced on the affected side of the body, not only by sensory and auditory stimuli, but even by emotions. Most patients suffer more severely with the pain and paresthesia when excited or worried. Still more remarkable, as Holmes says, is the fact that in many of these cases there may be an overreaction of the affected side of the body to pleasurable stimuli. In some cases, the patient would describe the stimulus on the normal side as just warm, and show no evident emotional reaction to it, whereas the same stimulus when applied to the affected side often would be described as delightful or soothing. Even when there is a total loss of thermal sensibility, a pleasurable reaction to warmth may be experienced. A woman with complete loss of thermal sensation found that a hot-water bottle at the affected foot made the whole side feel comfortable and pleasant, and eased the pains she constantly suffered in it.

The pains from thalamic lesions, though apparently spontaneous, are largely dependent on peripheral stimuli and may be considerably diminished and even controlled by preventing such stimuli, and these so-called spontaneous pains are largely, though not exclusively, the expression of overreaction to such peripheral stimuli.

As to disturbances of sensation from cortical lesions, Holmes states that most clinicians now admit that cortical lesions never abolish sensibility to pain, no matter how large they may be or where situated, provided that the lesion is not very recent and does not subject the subcortical centres to shock or diaschisis. It appears, therefore, that the afferent impressions which affect consciousness as pain do not react on the cerebral cortex, but act only on subcortical centres.

Acromegaly. Schlesinger¹ describes a distinct type of acromegaly in which the symptoms begin in youth and have a very chronic course. The development of the disease may be arrested at puberty and remain arrested as late as the fiftieth year. Changes in the soft parts and bones of the face may be typical of acromegaly, but changes in the

¹ Wiener medizinische Wochenschrift, No. 39, 1913.

sella turcica and ocular symptoms are usually entirely absent or only slightly marked. The typical changes in the limbs were not observed in one case. Gigantism does not occur in this early type of acromegaly, and there are no important changes in the genital organs. In one case the suprarenals were found diseased, in another an adenoma of the thyroid was found. Very small adenomas of the hypophysis were present in three cases and caused no pressure symptoms.

Treatment of Epidemic Meningitis. Flexner¹ replies in a judicial spirit to the criticisms made against the use of his serum and concludes the indications are that either in all the instances, or in practically all, excessive intracranial pressure was the source of the accidents, and he shows that this intracranial pressure could be avoided. As he says, we must not lose sight of the essential fact that in epidemic meningitis the struggle is with a highly fatal disease and the one means now possessed to combat it is the *antimeningitis serum*. It is not justifiable to withhold the remedy in spite of some small risk, in view of the far greater dangers to which the patients are exposed by the disease itself. Nor is it always possible to ascribe serious symptoms to the serum, even when they follow closely on the treatment. Sudden death in epidemic meningitis is a not infrequent occurrence, and cases have even been reported in which death has taken place while the physician was engaged in getting ready to make the serum injection and even before lumbar puncture had been performed. The attempt to discredit the antimeningitis serum on the basis of an unfortunate experience is, when everything is considered, hardly defensible. The heaping up of unhappy accidents seems to have occurred in a few places, while similar ones have arisen with rarity in other places. This fact alone suggests causes, local in nature, since it can hardly be imagined that the extraordinary experience is the result either of anatomical conditions in the patients or peculiarities in the infecting meningococcus.

Tuberculous Meningitis with Recovery. There can be no doubt that recovery from tuberculous meningitis may occur, but unfortunately it is not very common. Pitfield² puts it as possibly 1 in 200 cases and recommends a treatment suitable in most respects for any case of meningitis. The patient should be in a quiet, airy, dark room and kept as free from annoyance as possible. Lumbar puncture should be performed at once. In a case of Pitfield, 40 c.c. of fluid were removed every other day for two weeks, with marked amelioration in the symptoms. Forced feeding through nasal tube, with milk and eggs, should be done. Morphin should be administered for pain and as a sedative, if respiration is not embarrassed thereby; urotropin should be given freely because it yields free formaldehyde in the spinal fluid, and one or two injections of tuberculin should be given.

¹ Journal of the American Medical Association, June 21, 1913, p. 1937.

² American Journal of the Medical Sciences, July, 1913, p. 37.

Meningocerebellar Symptom-complex in Diseases with Fever in Tuberculous Children. Foerster¹ has observed a meningitis symptom-complex following some disorder with fever in children; in a few cases it preceded the fever. The meningeal symptoms lasted longer than the fever in all cases; in some, a few days longer; in others, they persisted a week or more. Although the meningeal symptoms were very pronounced in all cases, lumbar puncture was negative. Meningismus, therefore, was diagnosed, especially as in most cases the accompanying disease was pneumonia or bronchopneumonia with which meningismus is common. As the meningeal symptoms disappeared, cerebellar ataxia appeared in every case, although in a few cases the ataxia began early. The ataxia lasted at least several weeks and occasionally a month or more, but invariably disappeared sooner or later. All the children afflicted were tuberculous, and Foerster thinks tuberculous children may be liable to react to a fever with meningeal symptoms, possibly because a latent tuberculosis may be made active, or the condition may be a toxic meningeal irritation with internal hydrocephalus, or it may be encephalitis. No necropsy in a case of this kind has been obtained. Two attacks of this meningeal irritation have occurred in the same child. The condition is common, and the prognosis is good.

Changes in the Cerebrospinal Fluid in Mumps are not generally recognized, but they may be important. Feiling² states that Monod found a lymphocytosis of this fluid in 6 out of 8 cases examined, even though none showed any clinical evidence of meningitis. Chauffard and Boidin found marked lymphocytosis in two cases of mumps with high fever and severe headache. Feiling says cases of cranial nerve lesions in mumps, associated with a marked lymphocytosis of the cerebrospinal fluid, have been reported. Dopfer has described it in association with facial paralysis and with herpes of the trigeminal nerve distribution. I would warn against a too hasty diagnosis of intracranial disorder when the facial nerve becomes paralyzed, as this paralysis may result from pressure of the parotid gland on the nerve or from inflammation extending from the gland to the nerve. Feiling reports a case of probable meningitis occurring in mumps.

Hemianopic Pupillary Sign. This sign is very difficult to obtain and some keen observers even doubt its existence. It consists in contraction of the pupil only from illumination of homonymous halves of the retinae. Dejerine³ says he has observed the sign only in six cases during a period of twenty years, and with Jumentié he reports a case in which this sign was observed and necropsy was obtained. The sign has been supposed to indicate positively a lesion between the chiasm and the primary visual centres, *viz.*, the external geniculate

¹ Neurologisches Centralblatt, November 16, 1913, No. 22, p. 1414.

² Lancet, July 12, 1913, p. 71.

³ Revue Neurologique, February 28, 1914, p. 273.

body, the anterior colliculi of the corpora quadrigemina and the pulvinar. These authors found an old hemorrhagic lesion in the region of the external capsule, implicating slightly the posterior part of the putamen, and cutting off the visual cortex, therefore, a lesion not in the lower system but in the upper, and contradicting all the views entertained on the subject since Wernicke first described the sign. Dejerine and Jumentié conclude that the sign has little localizing value.

DISEASES OF THE SPINAL CORD.

Parasyphilis. There seems to be no longer any justification for the term parasyphilis, and this fact was clearly shown by Nonne¹ in his paper at the recent International Congress. The attempt to prove that tabes and paresis are caused by syphilis has been made for many years and much evidence has been obtained. In these so-called parasyphilitic diseases, as in cerebrospinal syphilis, there are lymphocytosis and increase of globulin and albumin in the cerebrospinal fluid. The Wassermann reaction was positive in the serum in 159 cases of paresis studied by Plaut. Since Hauptmann's method has been employed, the positive reaction is obtained in the serum in tabes as well as in paresis in 95 to 100 per cent. of the cases by almost all investigators. As to the appearance of symptoms after the infection, many cases are recorded in which tabes or paresis has appeared within the second or third year, and cerebrospinal syphilis has repeatedly been known to appear many years after infection, in one case observed by Nonne the first symptoms appeared thirty years after infection. The specific treatment is of no more avail in general for syphilitic arteritis than for tabes or paresis, but there are cases of tabes and paresis in which it is of service. Nonne has seen rigidity of the pupil disappear and his four reactions change under specific treatment. Nissl has said that all the changes found in paresis, in the cells, bloodvessels, glia, and plasma cells may be found in other diseases, and this Nonne believes to be correct. The combination of cerebral syphilis and paresis is no longer a pathological curiosity and syphilis of the circulatory system is common in paresis. The occurrence of lymphocytes and plasma cells in the pia and perivascular lymph sheaths of the central nervous system is common in tabes. While parasyphilis, therefore, cannot be sharply distinguished it is impossible to determine from our present state of knowledge why one person after syphilitic infection develops paresis, another tabes, and another cerebrospinal syphilis.

Tabes. FEAR AND ATAXIA. Ataxia may develop in tabes from apparently trivial causes as slight accident. Maloney² reports a case

¹ Proceedings of the International Congress of Medicine, 1913, Section of Neuro-pathology.

² Journal of Nervous and Mental Disease, November, 1913, p. 681.

in which ataxia began almost immediately after a fall down some steps, and refers to other similar cases in which the ataxia developed synchronously with or immediately after an accident. The ataxia not only appeared suddenly, but in one case was of acute degree from the onset. As there was not any ascertainable cause except the accident, Maloney attributes the ataxia to the accident. The accident was too trivial to produce organic changes and the effect must have been psychical. He refers to an interesting case: A man in a foreign country went down a steep staircase into a cave, and suddenly all the lights went out. He was very much frightened and collapsed. He was carried from the cave to a hospital and was very ataxic, and other signs of tabes were detected. Another man with pains and other symptoms of tabes, but without ataxia, walked well into a physician's office and became suddenly impressed by the idea that he had tabes. He staggered home with much difficulty and two weeks later he could not walk without the aid of a stick. Maloney writes his paper to emphasize the importance of psychic factors in producing coördination, and among these factors particularly to emphasize the influence of fear upon ataxia. He thinks distinct motor results of fear are evident in the great majority of tabetics. All tabetics tend to be more ataxic in public, at the change of level at street crossings, and under the stress of emotions and the influence of depressing weather conditions.

FEVER IN TABES. Fever lasting a few days is considered by some as a sign of tabes. It does not appear to be very common and the number of reported cases is very small. Wegelin, in 1911, collected the cases in the literature. Holland has observed temperature crises without gastric crises and without lancinating pains in tabes. No infection can be found for the fever. A case of tabetic fever has been reported recently by Siegrist.¹ His patient had fever in association with gastric crises and severe pain, and no other cause than tabes could be found.

REBOUNDED PUPIL. The rebounding pupil, as Fry² designates a phenomenon which must be familiar to many, may be of value in diagnosis. Many, doubtless, have observed it without attributing great importance to it. Fry understands under this name a prompt contraction of the pupil to light followed by dilatation to a position which is steadily maintained without alteration in the light stimulus. He has found it frequently in syphilitic and neurasthenic persons, and attributes it to a lack of tone in the constrictor apparatus of the pupil of variable duration in different cases. It would be desirable if some one would make a series of investigations enabling us to decide the clinical value of the sign. I have observed it often but have never felt that I could

¹ Münchener med. Wochenschrift, No. 49, 1913, p. 2726.

² Journal of Nervous and Mental Disease, July, 1913, p. 437.

put reliance on it in diagnosis, and Fry gives us no data from which we can estimate the value of the sign.

BINASAL HEMIANOPSIA IN TABES. Binasal hemianopsia is rare under all circumstances, and Heed and Price¹ have found only one case reported since Shoemaker wrote his paper in 1905. These authors now publish the finding of typical binasal hemianopsia in a case of tabes. The case was only a clinical one, consequently the situation of the lesion could not be determined.

ARGYLL-ROBERTSON PUPIL. There is considerable doubt in the minds of certain neurologists as to the correctness of the view that Argyll-Robertson pupil always indicates a syphilitic infection. Nonne's well-known case of chronic alcoholism in which no evidence of syphilis could be detected clinically or pathologically has met the objection that the patient died six weeks after he first came under observation, and had he lived longer he might have developed tabes or general paralysis. Otta Maas² has recently reported another case of isolated Argyll-Robertson pupil without any other clinical or postmortem evidence of syphilis, and only arteriosclerotic changes were found in the brain and cord. The Wassermann test was not made. We may hesitate to accept Nonne's opinion as positively proved, *viz.*, that persisting Argyll-Robertson pupil may be caused by chronic alcoholism, but the opinion has much to commend it. Maas says it is certain that slowness of pupillary response may result from alcoholism and repeatedly reflex pupillary rigidity has temporarily occurred in acute alcoholic intoxication.

PATELLAR REFLEXES IN OLD AGE TO BE DISTINGUISHED FROM DIABETIC REFLEXES. The patellar reflex is so often employed in the diagnosis of nervous disease that it is important to know the various conditions by which it may be modified. Age is one of these, and the activity of this reflex in advanced life has not always been found the same by all observers. Some have found this reflex diminished, others have found it increased. Schlesinger³ has examined 640 persons, all over sixty years; about one-fourth of these were over seventy. Of this entire number, 440 were men and 200 women. The patellar reflex was obtained in 96.3 per cent. of the men and 97.5 per cent. of the women. Sixteen of the men had no patellar reflex, but, in 14, either tabes or diabetes was found, so that old age could be regarded as the cause of the loss only in 2 cases. In only one woman was the loss of this reflex not attributable to disease. Schlesinger therefore concludes that the patellar reflex is present in 99 per cent. of healthy elderly persons. The Achilles reflex, however, fails more frequently in old age.

¹ Journal of the American Medical Association, March 7, 1914.

² Neurologisches Centralblatt, August 1, 1913, p. 958.

³ Deutsch. Zeitschrift f. Nervenheilkunde, vols. xlvii and xlviii.

SPIROCHILETA PALLIDA IN TABES AND PARESIS. Since Noguchi and Moore first discovered the *Spirochæta pallida* in paresis, the former has continued his studies and has reported the finding of the organism in 48 of the 200 cases of paresis he examined. The ages of the patients showing the organism varied from twenty-nine to seventy-five years; in one case the disease had lasted six years. The organism was found only in one of twelve spinal cords examined for tabes. It is very rarely found in the vicinity of the bloodvessels and almost never within the vessel walls. Noguchi has not found it in the pia. It looks as though the characteristic lesions of general paralysis and tabes are the result of the presence of the spirochætæ.

Noguchi¹ has produced typical syphilitic scleroses containing the *Spirochæta pallida* in the testes of two rabbits by the inoculation of an emulsion of the brain obtained from a parietic individual. The lesions developed slowly, requiring in the one instance ninety-two and in the other one hundred and five days. The poor success in these experiments, as regards the number of animals used, may be from the small number of organisms in the brain tissue or from a low degree of infectiousness of the brain spirochætæ for the rabbit.

An important confirmation of the finding of the *Spirochæta pallida* in the brain of paretics has been given by Forster.² This investigator obtained material by puncturing the brain in two living persons with paresis, and with Tomaszewski has studied in this manner 16 cases of paresis. In 4 cases, living spirochætæ could be demonstrated, and in one case at least they were very numerous. One patient with positive findings died later, and the typical lesions of paresis were found.

The spirochætæ have been found in the brain of cases of paresis not only by Noguchi and Moore, but also by Marinesco and Minea, Levaditi, Marie and Bankowski, and others.

Wassermann Reaction. Interesting results are obtained by Fildes and McIntosh³ regarding this reaction. They conclude:

1. In general diagnostic work, exclusive of nervous conditions, a positive reaction is so constant in active syphilis that such a diagnosis, made in the face of a negative result, will require very special support on other grounds before it can be considered probable.

2. A positive reaction in the cerebrospinal fluid indicates a syphilitic lesion of the central nervous system.

3. In active, untreated cases of dementia paralytica, tabes dorsalis, and cerebrospinal syphilis, the reaction is positive both in the serum and cerebrospinal fluid. In cerebral syphilis, without involvement of the spinal cord, the cerebrospinal fluid is usually negative. Except

¹ Journal of the American Medical Association, July 12, 1913, p. 85, and Journal of Cutaneous Diseases, Including Syphilis, August, 1913.

² Neurologisches Centralblatt, August 1, 1913, p. 983.

³ Brain, vol. xxxvi, Part 2, 1913, p. 193.

in the latter cases, the strength of the reaction has no certain diagnostic value.

4. The reaction is apt to be negative in the serum or cerebrospinal fluid in cases of hemiplegia, non-progressive tabes dorsalis, and old lesions of the nervous system, especially in cases of stationary congenital syphilis. It is also usually negative in the serum, particularly in very recent nerve lesions of the late secondary period, and in the cerebrospinal fluid particularly in treated cerebrospinal cases.

5. The occurrence of a positive reaction in one of the test fluids when the other is negative is so common that a reaction found negative in one fluid only is insufficient to exclude syphilis.

6. Pure "parasyphilitic" lesions do not respond satisfactorily to treatment, as shown by the slight effect upon the reaction in the cerebrospinal fluid. Cerebrospinal lesions react very readily to treatment. The celerity with which the reaction in the cerebrospinal fluid responds to treatment is an index of the "parasyphilitic" or "syphilitic" nature of the case.

7. The positive reaction in the serum is rapidly made negative by treatment in acute syphilis; but in chronic syphilis this effect is produced very slowly. In the cerebrospinal fluid, on the other hand, the rate of reduction of the reaction does not depend upon the duration of the infection. Thus, in gummatous lesions of the central nervous system, as also in acute secondary cerebrospinal syphilis, the effect of treatment upon the reaction in the cerebrospinal fluid is rapid.

8. The "provocative" injection of salvarsan for the purpose of exciting an exacerbation of the reaction has some, but probably an exaggerated, diagnostic value.

Neue and Vorkastner¹ have obtained positive Wassermann reactions in paresis in 96 per cent. of the serum examined and 95.5 per cent. of the cerebrospinal fluid. Most of the negative results date from the earlier studies. In a few cases, the positive serum reaction was obtained only by the method of Kromayer and Trinchese, and the positive cerebrospinal fluid reaction only by the method of Hauptmann. Since Neue and Vorkastner have been employing improved methods, they have been able to demonstrate the luetic etiology in every case of paresis, but not always in both fluids. They find their results have been better with the cerebrospinal fluid, and they recommend a later examination when the Wassermann reaction has been negative in one test.

Intradural Injection of Neosalvarsan. The treatment of paresis and tabes by the injection of neosalvarsan directly into the spinal canal or by using the serum into which neosalvarsan has been injected is exciting much attention. The results obtained in Europe are reviewed by Marinesco and Minea.² Their own results from injecting neosal-

¹ *Monatsschrift f. Psychiatrie und Neurologie*, August, 1913, p. 117.

² *Revue Neurologique*, March 15, 1914, p. 337.

varsan directly into the spinal canal in cases of paresis have been discouraging, as they produced disturbance of micturition and sensation, paralysis of the lower limbs, etc. Marie and Levaditi found that this treatment caused no improvement in the physical condition but improved the mental. Some excited paretics became calmed. They believed that the drug introduced by lumbar puncture was not conveyed to the brain. Ravaut obtained more favorable results, but Sicard expressed himself less optimistically. The intracranial injections of neosalvarsan or of salvarsanized serum has not been followed by great improvement. Marinesco and Minea find, from their own cases of syphilis of the nervous system in its various types, that the lumbar injection of serum salvarsanized *in vitro* gives more favorable results than the serum salvarsanized *in vivo* or the mercurial injections or intravenous injection of neosalvarsan, but the improvement is one of degree. These authors speak reservedly as to the duration of the improvement as the period of observation was from three to six weeks. The intracranial injection of serum salvarsanized *in vitro* has not been very encouraging. The unsatisfactory results obtained in the treatment of paresis are to be attributed, in the opinion of these writers, to the peculiar vitality of the spirochaetæ which cause paresis. Paresis is not a disease confined to the brain, it is not even confined to the nervous system, but the ductless glands and general nutrition are also affected. Subarachnoid injection of neosalvarsan is not sufficient in paresis and repeated intravenous injections of this drug should be employed also, for they exert a favorable influence on paresis, notwithstanding the statements to the contrary.

Hough¹ recently stated that about sixty cases had been treated by the intraspinal injection of serum containing salvarsan and there had been marked improvement in the syphilitic inflammatory process, as indicated by the four reactions, and in many patients, especially in those with tabes, there had been pronounced clinical improvement. Hough also has obtained good results with this treatment, and he states that in the study of the cerebrospinal fluid in 240 cases of paresis, some of which had received various kinds of treatment and in many of which repeated punctures had been made, he had never seen such pronounced improvement in the reactions as occurred under the intraspinal injections.

The work of Engman, Buhman, Gorham and Davis² seems to show, from a fairly large number of cases (100), that only a comparatively small percentage of those infected by the *Spirochaeta pallida* give serologic and cytologic evidence of cerebrospinal invasion, and when such an invasion does occur there are usually early clinical manifestations of it, which substantiate clinical observation.

¹ Journal of the American Medical Association, January 17, 1914, p. 183.

² Ibid., September 6, 1913, p. 735.

Lieberthal asserted, in the discussion of this paper, that it has not been proved that tabes, paresis, or cerebrospinal syphilis will develop in any case in which the cerebrospinal fluid gives a positive Wassermann and antisyphilitic treatment has not been employed. Brem,¹ however, believes it is fair to assume that those persons who have positive cerebrospinal fluid are promising candidates for the later organic nervous affections of syphilis, and if it is possible to change the fluid to normal they should be treated until this result is obtained. It is well known, he says, that syphilitic infections of the central nervous system are far more difficult to eradicate than infection which is located elsewhere, and that the blood Wassermann is far more easily made negative than the cerebrospinal fluid. In the incipient and atypical cases of tabes and paresis, the examination of the cerebrospinal fluid is invaluable for establishing the diagnosis, and in the advanced cases it is necessary as a therapeutic guide. Brem urges the giving of large doses of salvarsan, and he gives to those who bear it well in the proportion of 0.1 gm. for every 20 pounds of body weight. Small doses of 0.3 gm. or 0.4 gm. he considers worse than useless in the infections of the central nervous system, as they serve only to stir up the infection. He expects to obtain negative cerebrospinal fluid in all his cases after the administration of what he calls sufficient doses of salvarsan with mercury. After the fluid becomes negative, he advocates three more injections of salvarsan and then an examination of the fluid every three months for at least a year. A negative blood reaction is not a criterion of cure. In his treatment of fourteen cases of syphilis of the central nervous system, thirty-eight examinations of the cerebrospinal fluid have been made and sixty-eight intravenous injections of salvarsan have been given with vigorous mercury treatment. Two positive fluids have been changed to normal and in another the Wassermann reaction has been completely reduced, while the globulin reaction became weakly positive. The mean reduction of the Wassermann reaction has been about 50 per cent. for each group of three injections of salvarsan. Symptomatic improvement has been roughly parallel with the reductions of the reactions in the cerebrospinal fluid.

The intensive treatment of syphilitic affections of the central nervous system he thinks has not yet been proved a failure, and, when carried far enough and properly controlled, it offers great promise for the future of these hitherto incurable patients.

Cabot, discussing Brem's paper, referred to his own results in the treatment of patients by salvarsan serum injected into the spinal canal according to Swift's method. Swift uses the cell count and has noticed after this method of treatment a diminished number of cells. Improvement has been noticed at the Massachusetts General Hospital in cases

¹ Journal of the American Medical Association, September 6, 1913, p. 742.

of tabes following the injection of the patient's own serum. After he had received salvarsan into his blood he was bled and 30 c.c. of his own serum were injected into the spinal canal. The average dose of 30 c.c. given about once a week for a prolonged period strikingly ameliorated the condition of the spinal fluid and somewhat ameliorated the symptoms.

Syphilitic Wrist-drop. Bilateral wrist-drop, of the character seen in lead palsy, is not pathognomonic of lead palsy and has been recently described by de Massary, Boudon and Chatelin¹ as occurring from syphilis and probably from a lesion of the spinal cord. Their patient presented in the right hand greater paralysis of extension in the middle and ring fingers, but in the left hand extension of all the fingers was much affected and wrist-drop, was present on each side. There was no history of exposure to lead, but syphilis had been acquired. The supinator longus escaped as is usual in lead palsy.

Division of the Posterior Roots of the Spinal Cord for Pain has not always been successful and the reason may be that not sufficient roots are cut. In a case reported by Sicard, Desmerets and Reilly² pain was severe in the internal part of the right forearm and hand, and, for relief, the seventh and eighth cervical and first thoracic right posterior roots were cut, but the pain was diminished only a few days. A second operation was performed, and the fifth and sixth cervical and second thoracic right posterior roots were divided. This second operation was successful in removing the pain. It would seem, according to these authors, that for the relief of pain in a limb by root division, six or seven consecutive posterior roots should be cut containing at their centre the roots chiefly concerned in the pain.

Brown-Séquard Paralysis. The loss of motor power on one side of the body and of pain and temperature sensations on the opposite side form the symptom-complex of Brown-Séquard which is indicative of a hemi-lesion of the spinal cord. It has been demonstrated by Claude and Rouillard³ that the crossed sensory disturbance may be absent. The injury in their case was from a knife cut causing a vertical wound. No necropsy was obtained, but, from the symptoms, one might reason that the crossed pyramidal tract had been cut and the peripheral sensory fibers of the anterolateral column had escaped. Such a case as this would be of great value if the location of the lesion were known exactly.

Tumor of the Cord. **REFLEXES OF DEFENCE.** The value of the reflexes of defence, described in my review in *PROGRESSIVE MEDICINE* last year, is shown by a case of tumor of the cord reported by Babinski and Barré.⁴ The area of impaired sensation extended as high as the

¹ *Revue Neurologique*, February 28, 1914, p. 278.

² *Ibid.*, July 30, 1913, p. 107.

³ *Ibid.*, February 28, 1914, p. 288.

⁴ *Ibid.*, p. 262.

fifth thoracic distribution. The reflexes of defence could be obtained by irritation as high as the ninth thoracic distribution on the right, and as high as the eighth thoracic on the left. The tumor was, therefore, diagnosed as implicating the spinal cord from the fifth thoracic segment to the eighth or ninth thoracic. Laminectomy was performed, but the dura was not opened. The patient seemed to be doing well immediately following the operation, but death occurred the next morning. The necropsy showed that the tumor was extradural and compressed the cord from the fifth to the eighth thoracic segments inclusive. Why did death occur in this case from laminectomy? The operation is not usually regarded as very grave. The patient was in good condition, the operation was not prolonged, the dura was not opened, and the cord was not damaged. The sympathetic fibers for the heart emerge from the cord in the upper thoracic region and it may be that laminectomy at this region is more serious than at other parts of the spinal column.

CAUDAL LESIONS SIMULATING TUMOR. Lesions of the cauda equina may cause symptoms so much like those produced by tumor that the proper diagnosis may be impossible until operation has been done or a necropsy has been obtained. The five cases reported by Kennedy, Elsberg, and Lambert¹ are an important contribution to caudal lesions. At operation, many, or even all, of the caudal roots were swollen, congested, and of a bluish-red color. The difference between the color of these nerves and the color of the normal nerve roots was striking and easily recognizable. The changes seemed to be caused by intense hyperemia on the surface of the nerves, which extended into the nerves themselves. Adhesions between the nerve roots were present only in one case; in the others, the only changes were swelling and discoloration. In all five cases, the inner surface of the dura was smooth and glistening, and without signs of inflammatory change, though in two of them a few small areas of hyperemia were observed. The cerebrospinal fluid was normal in appearance in four cases, while in one the color was more yellow than is usual. The amount of fluid which escaped when the dura was incised was considerable in several of the cases, but was no more than one often finds within the dural sac. In one case in which a necropsy was obtained, considerable degeneration was found within the cord.

The authors believe their cases are not examples of a localized specific meningitis on account of the absence of either a luetic infection or luetic serological findings, and the absence of distinct meningeal changes in any one of them. In several of the cases there was a history of trauma which preceded the beginning of the symptoms by many years. In none had the trauma been of recent date and in

¹ American Journal of the Medical Sciences, May, 1914, p. 645.

none had a lumbar puncture been performed so recently that the congestion of the roots could have had any connection with that procedure. A search of the literature revealed no exactly similar cases in man, but the caudal discoloration has been found in the horse.

These authors believe that their cases and perhaps some of those in the literature with like histories are examples of a true toxic neuritis of the caudal nerve roots, and they refer to the well-known experimental work of Orr and Rows by which it has been shown that toxins are capable of travelling from the sciatic and other nerves to the posterior root ganglia, along the spinal roots, and upward in the cord. They think a tuberculous or syphilitic meningomyelitis or neuritis can be definitely excluded, as no lymphoid or plasma cell exudate or luetic type of endarteritis was present in the case with necropsy.

DIAGNOSIS BETWEEN TUMOR AND MENINGOMYELITIS. A case of meningomyelitis simulating tumor has recently been studied by Oppenheim.¹ A man developed symptoms suggesting tumor of the cauda equina, although the possibility of meningitis serofibrosa was considered. Operation did not reveal tumor, but the cerebrospinal fluid was increased in amount and the cauda roots appeared grayish, with injected vessels. Death occurred a few weeks after the operation. The conus and lower part of the cord were found to be the seat of meningomyelitis, but no pathological evidence of syphilis was obtained. Another case similar to this has been reported by Oppenheim, and Nonne also has recorded one, but the nature of the process needs further study. Surgical intervention is not demanded immediately when a tumor of the cauda is diagnosed, and Oppenheim recommends caution. He advises the exclusion of syphilis and operation only when progression of symptoms makes delay dangerous. Lumbar puncture may reveal tumor cells in the cerebrospinal fluid when tumor exists. Operation is contra-indicated in cases of meningomyelitis.

In my experience, tumor of the lower part of the cord so often is of malignant character that it becomes very important to study this meningomyelitis in every aspect. As yet we cannot differentiate it clinically with certainty from tumor. The important fact is that when meningomyelitis exists, surgery is not in place, unless it be employed when the diagnosis is uncertain.

CEREBROSPINAL FLUID IN CASES OF SPINAL TUMOR. The chemical analysis of the cerebrospinal fluid does not as yet assist us greatly in clinical diagnosis of nervous disease. Raven² has studied the albumin increase alone and with xanthochromia of this fluid in compression of the spinal cord. The changes in the fluid are numerous and there is nothing typical of the different kinds of compression or of the location of the compression. In the material studied, xanthochromia was

¹ Monatsschrift f. Psychiatrie und Neurologie, June, 1913, p. 451.

² Deutsche Zeitschrift f. Nervenheilkunde, vol. xlix, Nos. 1 and 2, p. 335.

found in 8 out of 24 cases, 33.3 per cent. of extradural compression, and in 11 out of 16 cases, 68.75 per cent. of intradural compression. Where lymphocytosis was great, it was attributable to inflammation or admixture with tumor cells. As yet, therefore, it can be said only that isolated phase 1 of Nonne-Apelt or xanthochromia with increase of albumin, when other causes can be excluded, indicates compression of the spinal cord, but nothing can be told concerning the character or location of the compression. There is great need of further study of this subject. It is not always easy to exclude causes of the change in the fluid other than those of compression.

SPINAL TUMOR TREATED BY RADIUM. That improvement may result from the radium treatment of intramedullary tumor of the spinal cord is shown by the report of a case treated by Clarke and Lansdown.¹ Their patient had an irremovable tumor of the lumbosacral region. Some weeks after operation, the tumor was treated by placing a tube containing 50 mg. radium for twenty-two hours in the spinal canal, with the result of steady and progressive improvement in movement and sensation in the previously paralyzed lower limbs, until the onset of acute cystitis which caused death. The authors thought before the cystitis developed that a considerable degree of recovery would occur, possibly nearly complete recovery. The cerebrospinal fluid contained much yellowish pigment (lutein). These authors state that at the Bristol General Hospital this pigment has never been found in the cerebrospinal fluid except in cases of tumor, and its presence may be taken as a valuable confirmatory sign of tumor.

THYROID TUMOR WITH VERTEBRAL METASTASIS. Metastasis from tumor of the thyroid gland is not very common. According to Jacobaeus,² 25 to 36 cases are known. The thyroid tumor is an ordinary struma of moderate size and without implication of the surrounding tissue. It appears as a benign growth under the microscope; exceptionally in scattered places it may show malignant change. The struma may be so small as to cause scarcely any enlargement of the thyroid. The metastatic growth is seldom in the neighboring lymph glands, but usually in the lungs and bones, especially the red marrow of the short bones, and grows very slowly. It may last ten or more years, especially in the skull, before it causes death. Cachexia appears late. The metastatic tumor in half the cases remains solitary until the end. According to Jacobaeus, only one case besides his own was correctly diagnosed clinically and operation was performed without improvement in the symptoms. In the case that Jacobaeus reports, an apparently benign struma was operated upon thirteen years before symptoms of compression of the spinal cord appeared. The nervous symptoms developed very slowly, root symptoms were slight, and

¹ British Medical Journal, May 9, 1914, p. 1009.

² Deutsch. Zeitschrift f. Nervenheilkunde, vol. xlix, Nos. 1 and 2, p. 74.

x-ray showed caries of a vertebra. Laminectomy was performed and the bone was found to be very vascular. The condition was temporarily much improved by relief of pressure thus afforded. Radium therapy was of little service.

Traumatic Form of Meningitis Spinalis Serofibrosa Circumscripta. Inflammatory thickening of the spinal meninges in the region of the cauda equina is a condition that may be relieved by operation and that has especially interested Oppenheim and Krause.¹ These authors have recently reported two interesting cases. In one, a man, while exercising, fell, and had severe pain in the sacral and left lumbar region and later in the distribution of the left sciatic nerve. Paresthesia in the left lower limb and retention of urine developed. Pain over the left lumbar and sacral region was caused by pressure, and, although there was no deformity, x-rays showed subluxation of the fifth lumbar vertebra. These and other symptoms led to a diagnosis of hemorrhage or incarceration of the cauda equina. Operation revealed chronic adhesive meningitis at the level of the upper part of the sacrum on the left side, with union of the roots with one another and with the meninges. The cerebrospinal fluid above this lesion was increased in amount. The new-formed tissue was cut through and two days after the operation the condition began to improve; on the eleventh day the bladder began to be emptied voluntarily and eventually complete recovery occurred.

Another case similar to the above is reported by these authors. A young man had fallen several times upon the left hip. Severe pain began in the left inguinal region, and, after six months, the pain extended to the left lumbar and sacral region and left lower limb. The x-ray showed nothing abnormal, and the condition was made worse by mercury. The diagnosis of a lesion of the cauda equina at the third lumbar vertebra was made and tumor was suspected. At the operation the cauda was found to be injected and delicate adhesions of the arachnoid were broken. The pain gradually diminished and, after a considerable time, complete recovery occurred.

The operations in these cases permanently relieved the pressure from the excessive amount of cerebrospinal fluid as the dura had been opened. The breaking of adhesions also was of service.

Reflexes of Defence in Pott's Disease. Souques and Nadal² studied the reflexes of defence in two cases of compression of the cord in Pott's disease. In both, there was spastic paraplegia with flexion of the lower limbs. In one, the anesthesia of the lower limbs was complete. When the foot of one side of this boy was irritated, as by pressing the toes downward, the foot of this side was flexed on the leg, the leg

¹ Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie, vol. xxvii, No. 3, 1914.

² Revue Neurologique, December 30, 1913, p. 774.

was flexed on the thigh and the thigh was flexed on the abdomen, while the toes were extended. At the same time, the opposite lower limb was extended at all parts, with plantar flexion of the toes. These reflexes have been described by Marie and Foix, and correspond to what Philipson and Sherrington have obtained experimentally in the dog. They represent the movements of walking in spinal automatism.

The action of the bladder and rectum in this case was interesting. Notwithstanding there was complete paralysis of motion and sensation in the lower limbs and complete anesthesia of the bladder and rectum, the vesical and rectal sphincters were not paralyzed. The patient had no desire to empty the bladder or rectum and had no voluntary control of these parts, and yet both discharged their function regularly. He urinated four or five times, and emptied the bowels once in twenty-four hours without knowledge of these movements. There was reflex movements of spinal origin dependent on the physiological separation of the cord from the brain. Louques and Nadal say these automatic discharges of the bladder and rectum have not been observed, or at least no report of them is to be found, and the action of bowels and bladder in spinal compression should be restudied. They do not occur when the reflex arcs are affected.

A Family Form of Syringomyelia. An interesting form of syringomyelia occurring in three members of one family, two brothers and a sister, is described by George E. Price.¹ The condition was that known as Morvan's disease, which has been shown to be either syringomyelia or leprosy. The fingers most affected showed spontaneous amputation of the distal phalanges, either partial or total. The skin over the hands was thickened and the joints of the fingers were enlarged and stiff. The feet were in much the same condition as the hands, and in hands and feet all forms of sensation were lost. Investigation of the family history failed to reveal any etiological factor. The parents were living and well and had two other children in perfect health, but these children had not reached the age at which the symptoms first appeared in their sister and brothers. Raynaud's disease was excluded by the absence of the characteristic vasomotor changes and the presence of whitlows, with the loss of sensibility. In sclerodactyla Price thinks there would be no loss of sensation nor spontaneous amputation of fingers and toes. Anesthetic leprosy, of course, was considered, but was excluded because cutaneous pigmentation was absent and the sensory disturbance was segmental instead of corresponding to peripheral nerve distribution, and two specialists in skin diseases, Stelwagon and Gaskill, who had examined the patients, were convinced that the lesions were not those of leprosy. Price could not find any report of such a syndrome occurring in two or more members of one family and concluded that his cases

¹ American Journal of the Medical Sciences, September, 1913, p. 386.

suggest the possibility of a new familial type. Thus the list of family diseases of the nervous system is constantly growing.

Argyll-Robertson Pupil in Syringomyelia. There are those who hold that the Argyll-Robertson pupil is always a sign of syphilis, but this view is not correct. Such a case as that reported by Sicard and Galezowski¹ would show that the sign may occur elsewhere than in syphilis. Their patient had syringomyelia and Argyll-Robertson pupil only on the left side, and they believed they could exclude syphilis. The patient was a woman who had early entered a religious order. The Wassermann reaction of the blood and cerebrospinal fluid was negative, and the cerebrospinal fluid presented no change in albumin or cellular contents. Unilateral Argyll-Robertson sign in syringomyelia has been observed in at least two other cases (Dejerine and Mirallié, Rose and Lemaitre), but in these the Wassermann reaction and examination of the cerebrospinal fluid were not made.

Charcot-Marie Atrophy with Spasticity. The atrophy known by the names of these two French neurologists is almost always with loss of tendon reflexes, but it may be with spasticity. Dejerine published, in 1896, the report of a family in which this complex occurred, and now Dr. and Madame Long² relate the later development of this family. They found preservation, and even exaggeration, of tendon reflexes and Babinski phenomenon of the big toe, where the disease was less advanced. The atrophy began in the extremities of the lower limbs and later extended to the upper limbs. When the atrophy was of long duration, Babinski's sign had disappeared, probably because the loss of muscle prevented the movement. It seems strange that this form of atrophy, with exaggeration of tendon reflexes, should occur in one family, and the explanation given is that the lateral columns must have been more affected than in most cases of the Charcot-Marie type. One may recall, in this connection, the occurrence of the family form of spastic paralysis.

Experimental Multiple Sclerosis. What seem to be important results in producing multiple sclerosis in animals are reported by W. E. Bullock.³ It was found possible to produce paralysis of the limbs in four rabbits out of five by injecting cerebrospinal fluid, withdrawn under rigidly aseptic conditions in a case of multiple sclerosis, subcutaneously into rabbits. The fluid was found to be potent after exposure to a temperature of 0° C. for fourteen days and after being filtered through unglazed porcelain. Histologic examination of the spinal cord revealed a complete reproduction of the appearances found in the human being. Bullock thinks that if one assumes that multiple sclerosis is a definite entity and that his first patient from whom cerebrospinal fluid was

¹ *Revue Neurologique*, July 30, 1913, p. 105.

² *Ibid.*, May 30, 1913, p. 696.

Lancet, October 25, 1913, p. 1185.

obtained was an instance of the disease, one is bound to conclude that the cause of the disease is either a filtrable virus (organism) or a water-soluble poison found in the cerebrospinal fluid. While the final demonstration of the first conclusion is not yet obtained, he thinks the balance of probability lies in its favor. Thus the fact that paralysis occurs from fourteen to twenty-two days after inoculation is fairly strong evidence against a non-living poison. Against all this must be placed the possibility that the disease which we call multiple sclerosis is not individual, but that it may be a symptom-complex which may be produced by two or more causes. The fact that the cerebrospinal fluid obtained from Bullock's second case failed to cause paralysis in four wild rabbits lends some support to this assumption. Wild animals were used in these experiments, whereas tame animals were employed in the first. It is very desirable that these experiments should be repeated until we have more data for final conclusions.

DISEASES OF THE NERVES.

Paralysis of the Spinal Accessory Nerve. A most extraordinary accident is described by Kaiser.¹ A man, while walking, slipped and fell and ran the point of his umbrella into his head behind the ear. The spinal accessory nerve alone was paralyzed as a result of this, and the case permitted a study of the function of this nerve. The conclusions are that the external branch of the nerve does not supply the entire trapezius, but only the upper and lower parts; the middle part probably is supplied from cervical nerves. This branch supplies only a part of the sternocleidomastoid muscle and that portion is the clavicular, while the sternal portion probably is supplied by cervical nerves. The inner branch of the spinal accessory nerve contains only motor fibers and supplies the soft palate as well as the larynx. The facial nerve gives no branch to the soft palate. It is indeed remarkable that only one nerve should have been injured in this accident.

Paralysis of Abducens Nerve from Middle-ear Disease. A sufficient number of cases of paralysis of the abducens nerve associated with middle-ear disease have occurred, as Sterling² indicates, to show that a relation of cause and effect exists. The nerve paralysis has been supposed by some to be caused by a neuritis of infectious origin from the ear disease; by others the way of infection has been attributed to the venous sinuses. An especial form of this symptom-complex bears the name of Gradenigo. The patient usually is young and has otitis media, and has also severe pain in the frontal and parietal regions. About a month after the onset of the otitis or even earlier, diplopia develops suddenly and depends on paralysis of the external rectus

¹ Deutsch. Zeitschrift f. Nervenheilkunde, vol. xlix, No. 3, p. 214.

² Monatsschrift f. Psychiatrie und Neurologie, December, 1913, p. 568.

muscle. The symptoms usually last about two months, although in some cases they have lasted longer. In rare cases the symptoms become more severe, and indicate diffuse meningitis and terminate fatally. The symptom-complex of Gradenigo thus consists of three signs, otitis media, severe frontal and occipital pain, and abducens paralysis. Gradenigo believed a localized meningitis at the point of the petrous portion of the temporal bone caused the nerve palsy. Many cases of this complex without the pain have been reported and by some the nerve palsy has been regarded as a reflex palsy. Irritation of the labyrinth may, through the vestibular nerve and Deiters' nucleus, react upon the abducens nucleus and even the oculomotorius nucleus. The explanation is ingenious but not beyond criticism.

Multiple Neuritis of Cranial Nerves may cause difficulty in diagnosis when the nerves of the limbs are not affected, as it may not always be easy to determine whether the disease is within the brain or is confined to the nerves. The diagnosis is important, as the prognosis is not the same in the two conditions. A case such as that described by J. N. Roy¹ is unusual. His patient developed blindness, deafness, total paralysis of the palate and partial paralysis of the larynx; supposed to be caused by alcohol and tobacco. He had also serous meningitis and choked disk. He was a young man, aged twenty-three years, and after having taken a large quantity of alcohol and having smoked much, he became suddenly blind, his hearing became impaired, and food regurgitated by the nostrils. He had used alcohol and tobacco excessively for four years and had taken as much as thirty glasses of gin and inhaled seventy-five cigarettes a day. During the three years previous to observation by Roy, he had had epileptiform attacks. A year previous he had a slight attack of toxic amblyopia which gradually disappeared. The severe attack began with headache increasing steadily, then sight began to fail and one morning he discovered that he was completely blind. He had not taken any methylated spirits. Hearing was somewhat impaired and then regurgitation of food through the nostrils on attempts to swallow developed. The pupils were dilated and reaction to light was slight. He had bilateral optic neuritis. The soft palate was paralyzed, as was also the right posterior crico-arytenoid muscle, and the right vocal cord was fixed in a median position. The neck was stiff, and Kernig's sign was present. Lumbar puncture improved the condition. In a little more than a month, the patient was discharged entirely well.

Facial Palsy. Paralysis in the distribution of the facial nerves occurs infrequently from syphilis and, when so occurring, may be bilateral. In the case reported by Ewing² only the facial nerves were affected and the paralysis was complete. The motor tracts were not implicated,

¹ Canadian Medical Association Journal, October, 1912.

² Journal of the American Medical Association, May 9, 1914.

although they are sometimes in syphilitic facial palsy. The palsy developed rapidly and began January 1, 1914, and syphilis was contracted about September 13, 1913, therefore, the onset of cerebral syphilis was soon after the syphilis had been acquired. The Wassermann reaction was positive. The treatment was by injections of neo-salvarsan and salicylate of mercury with electricity, and almost complete power was regained in the lower part of the face while the upper part showed much return of function.

Lasarew¹ calls attention to a hitherto undescribed form of facial palsy occurring with tumor of the posterior cranial fossa. The lower branch of the nerve is paretic, both in voluntary and emotional movements, but the irritability of the upper branch of the nerve is increased. When the patient is made to wrinkle the forehead, the wrinkles on the affected side of the face are more pronounced. Only the frontalis muscle is disturbed in this way, as the corrugator supercilli is not implicated. The phenomenon has been observed by Lasarew in four cases, two of tumor of the cerebellopontine angle, and two of tumor of the cerebellum.

CONGENITAL FACIAL PALSY is of rare occurrence and is, of course, distinct from the form caused by pressure of the forceps at birth. The most common cause is atrophy of or arrest in the development of the facial nucleus. Defects of bone in which the nerve is contained is very rarely the cause of the paralysis, but Aloysio de Castro² reports a case of this type. In his case, the external ear was wanting, and was represented by a roll of skin with an opening the size of the head of a pin. The mastoid process was much smaller on this side, and deafness on this side was complete. A few similar cases are reported in the literature.

Arteriosclerotic Optic Atrophy. Neurologists have not paid as much attention as ophthalmologists to optic atrophy from arteriosclerosis. Bonhoeffer has described arteriosclerotic choked disk, and emphasized the infrequency of changes in the eyeground from vascular disease, and now Klieneberger³ reports three cases of optic atrophy which he attributes to the same cause. R. Otto also has studied the arteriosclerotic changes of the optic nerve. All three of Klieneberger's patients were aged and, excepting the optic atrophy, had no signs of organic cerebral disease. They had symptoms of a functional character not uncommon with arteriosclerosis, as vertigo, headache, and failure of memory. These cases were without necropsy and, therefore, cannot be regarded as conclusive; one even had a positive Wassermann reaction in the blood.

Neuralgia of the Twelfth Thoracic Nerve Simulating Visceral Lesions. This subject has received little attention, but, as T. K. Dalziel⁴ shows,

¹ *Neurologisches Centralblatt*, January 2, 1914, p. 13.

² *Ibid.*, December 1, 1913, p. 1474.

³ *Monatsschrift f. Psychiatrie und Neurologie*, June, 1913, p. 519.

⁴ *British Medical Journal*, October 25, 1913, p. 1087.

it has much importance. He has seen neuralgia of this nerve simulate visceral disease so closely as to lead to the performance of laparotomy; in one case the ovary, kidney and appendix had been removed and yet the patient's only complaint was neuralgia of the right twelfth thoracic nerve, as shown by the complete relief obtained by division of this nerve. The anatomical relations explain why neuralgia of this nerve is so inveterate. The nerve passes from under the twelfth rib to above the pubis, piercing the different layers of the abdominal muscles and giving a branch over the crest of the ilium which may easily be injured accidentally or in the course of occupation where weights are carried on the haunch.

The neuralgia of this nerve may be slight and of short duration, but, in twenty-two cases in which Dalziel has operated, the condition had persisted so long and the pain had been so great as to make the patient willing for relief by operation. As the nerve is chiefly sensory, Dalziel says there need be no hesitation in dividing it. The patient, after operation, may complain of a sense of coldness and numbness in the region supplied by the nerve, but this usually soon passes off.

Three points of pain generally are to be found: a painful area immediately under the twelfth rib, by the outer border of the quadratus lumborum; another to the inner side of the anterior superior spine of the crest of the ilium, and an area above and to the outer side of the pubis. The pain may thus suggest disease of the kidney and ovary and, on the right side, appendicitis.

Almost invariably, Dalziel says, an area of tenderness can be determined in the region supplied by that branch of the twelfth nerve which crosses the crest of the ilium. Tenderness in this area has been supposed to be associated with ovarian disease. Dalziel thinks that many of the cases of ovarian neuralgia and appendix colic unrelieved by operation may be caused by neuralgia of this nerve.

The first case he had was that of a man who, for fifteen years, had spent the greater part of his time as an invalid. He was a working man who in his occupation had had frequently pressure on his left haunch. The pain at times was excruciating, with intervals of comparative comfort, but never such as to allow him to do full work. As there was no apparent reason for his suffering apart from his neuralgia, Dalziel exposed and destroyed the twelfth thoracic nerve, with relief so immediate and complete that within six weeks he was once more at work and has continued well.

Dalziel thinks it probable that, in some cases, the iliohypogastric nerve may be at fault, but this involvement is less frequent and less likely to occur than is involvement of the twelfth thoracic nerve.

Anterior Crural Neuritis. Neuritis of the anterior crural nerve is not common. The most recent and thorough consideration of this subject

¹ Journal of Nervous and Mental Disease, December, 1913, and January, 1914.

has been given by C. M. Byrnes.¹ He finds it is chiefly met with in middle-aged and elderly people, but one case has been described in a child, aged seven years. By far the greatest number of cases have occurred between the ages of fifty and sixty. It is more frequent in males, probably because their activities subject them more frequently to the extremes of temperature and climatic conditions. The onset may be acute or subacute, and the symptoms in large measure are those of inflammation of other nerves. Byrnes believes that the statement that anterior crural neuritis is among the rarest nerve affections is not supported by facts. He has collected 136 cases, and although these are not sufficient to permit this form of neuritis to be classed among the common disorders, he believes there are many more instances which have either not been recognized or have been thought to merit no further consideration. As a secondary neuritis, it has been observed in many conditions which are of interest to the internist, the gynecologist, the obstetrician, and the surgeon. Although extremely rare as a primary or idiopathic affection, the recognition of its occurrence as such may be helpful in differentiating some otherwise obscure disorders of the lumbar nerves.

Atrophy of Hand from Localized Neuritis. Arrested atrophy of the small muscles of the hand has been studied by Marie and Foix.² It may result from various causes, from radicular or other neuritis or from small lesions in the anterior horns of the spinal cord, and the latter are usually syphilitic. The atrophy may affect the thenar eminence or the hypothenar eminence, or both, but Marie and Foix have never seen it strictly confined to the hypothenar eminence. The thenar often is affected alone and the adductor of the thumb escapes. This distribution does not prove a neuritic origin, as Marie and Foix have found the cause to be poliomyelitis, but it is more likely to be neuritis. They have reported recently an atrophy confined to the thenar eminence and caused by interstitial neuritis situated at the annular ligament, but exactly in what way the ligament affected the median nerve is uncertain.

MISCELLANEOUS NERVOUS DISEASES.

Epilepsy. **PSYCHIC EPILEPSY.** Although epilepsy is unfortunately too common, the psychic form is rather rare. A case of this type described by George E. Price³ is interesting. During a certain evening a woman heard her husband snapping an empty revolver in an adjoining room. He had been irritable and fatigued in the evenings after returning from work. Upon entering the room, the wife found her husband confused and entertaining the delusion that a man was in the

¹ *Revue Neurologique*, November 30, 1913, p. 647.

² *Journal of Nervous and Mental Disease*, September, 1913, p. 580.

room whom he apparently was trying to shoot. In less than an hour his mind cleared and he had no recollection of what had occurred. He then complained of headache and wanted to sleep. In a period of about a month he had seven other attacks, all occurring at night. No one saw him at the onset, but he would be found confused, hallucinatory and delusional, always believing a strange man was in the room and entertaining in a more or less vague way the delusion of marital infidelity. The attacks lasted from fifteen minutes to an hour, and were always followed by headache. His wife stated that she could usually tell, the evening before her husband had an attack, of its imminence, as he would appear somewhat dazed and unresponsive, though not confused. There was no biting of the tongue nor voiding of the urine, and the bed-clothing was not disarranged as after an epileptic convulsion. On one occasion he got out of bed and wandered about the house apparently seeking an imaginary man. At no time had he been dangerously violent, although upon several occasions he had been somewhat rough with his wife. Some of the spells were of brief duration, one lasting only two minutes. There is no recollection of the happenings of the attack by the patient when in his normal condition.

Under rest treatment and bromides, the attacks subsided, and the man improved physically, but, when he returned to business, the spells reappeared. During all his attacks his face was markedly suffused.

Price regarded this case as one of epilepsy, although convulsive attacks were wanting. He bases this diagnosis not so much upon the character of the mental symptoms as upon the mode of onset, duration, and termination of the attacks, combined with the history of the case. The onset of the epileptic psychic equivalent is abrupt, like the onset of a convulsion. In Price's case, one attack occurred when the man was startled by the sudden snapping of the key to an electric-light bulb.

Price discusses psychic epilepsy in an interesting manner. The symptoms of the condition, as he states, range from a violent delirium with frightful hallucinations to a simple automatic continuance of the patient's occupation at the time of the onset. Thus, a man may walk for several blocks, or drive a team a considerable distance, without any subsequent recollection of the occurrence. Often the convulsion is replaced by a sudden instantaneous impulsion, as to commit some obscene act, to kill or to destroy, each succeeding attack being likely to resemble the original impulsion. The medicolegal importance of the condition is obvious. In some cases, the psychic equivalent alternates with the convulsion, and then the diagnosis may be easy, but, in other cases, it may be very difficult.

EPILEPSY AND PARESIS IN ENGINEERS. It is very true that paresis and epilepsy in railroad engineers and others holding important posi-

tions by which the lives of others are put in their care, may cause great danger. So long as these diseases are unrecognized, the risk to life is great. Camp¹ discusses this subject and it has been previously discussed by Knapp, and each has observed illustrative cases. Camp recommends that careful medical examination should be made frequently for the presence of symptoms indicating the existence of these affections, and especially the employment of objective tests, such as those of the pupillary reflexes, best calculated to demonstrate their presence and not requiring too much time in their performance. The selection of the tests to be employed and the value to be placed on each might be determined by an expert appointed by the company, who might then instruct the company's regular examiners, either by printed instructions or by lectures or demonstrations, in the use of these tests. Such simple tests might not be diagnostic, but if the suspicions of the company's regular examiner were aroused he could refer the suspected case to a consultant who could make a more extensive examination.

TUBEROUS SCLEROSIS IN EPILEPSY. Tuberos sclerotic of the brain at first was interesting only as a pathological curiosity, but gradually the condition has become recognizable by the clinical manifestations. Hard, rather sharply defined tumor-like masses are found in the cerebral cortex, with often pea-size tumors in the lateral ventricles. Brains of this character have been obtained from epileptic idiots who have died in early youth. Further study has disclosed other signs which made the clinical diagnosis possible. Adenoma sebaceum and other cutaneous formations, similar tumor masses in the viscera, especially in the kidneys and heart, have been found, and a relation has been detected between tuberos sclerotic and neurofibromatosis (v. Recklinghausen's disease). The cerebral masses are now generally regarded as defects in embryonic development, and the inflammatory theory has been rejected. The relation of tuberos sclerotic to brain tumor has not been determined.

Schuster² reports several clinical cases of tuberos sclerotic and one with necropsy in which a glioma of the cerebrum was found. The association of this tumor with the tuberos sclerotic he thinks shows close connection between the two processes. His cases show that imbecility is not always an accompaniment of tuberos sclerotic. The adenoma sebaceum may appear as yellowish or copper-brown nodules of the size of the head of a pin or of a grape in the skin of the cheeks near the nose; or as rather flat skin tumors, reddish and hard, resembling keloids and without sharp definition. Other members of the family, as well as the patient, may show nevus formations in the skin, and tuberos sclerotic is to be regarded as a hereditary affection.

¹ Journal of the American Medical Association, August 30, 1913, p. 655.

² Deutsch. Zeitschrift f. Nervenheilkunde, vol. 1, Nos. 1 to 4.

MIGRAINE AND EPILEPSY. The possible relation of migraine to epilepsy has claimed the attention of physicians during a long period of years and, by some, such a relationship has been accepted; by others, it has been emphatically rejected. A recent writer in support of the relationship is George A Waterman,¹ and he presents his arguments under the following headings:

1. The interchange of one disease for the other in different generations of the same family.
2. The appearance of migraine in early life, giving place to epilepsy later, with a resulting disappearance of the migraine or diminution of the intensity of the migraine attacks. In these cases the epileptic seizures may be ushered in by the same aura which gave warning of the earlier attacks of migraine.
3. The development of migraine attacks in patients previously suffering from epilepsy and in whom the epilepsy has been cured by bromide treatment.
4. The appearance of symptoms of epilepsy in the migraine attacks of certain individuals.

Waterman thinks that the alternation of epilepsy and migraine with more or less regularity in the same person may be due to the coincidence that the patient has the two diseases. It is not strange that two diseases so commonly thriving on neuropathic soil should at times afflict the same individual. However, substitution of the one disease for the other in the same person, or the occurrence of symptoms common to both diseases in an attack must indicate relationship. He gives the notes of many interesting cases observed by himself or taken from the literature which seem to establish a relationship between these two neuroses, and he finds, from his examination of the literature, that the majority of authorities accept this relationship.

OPERATIONS FOR EPILEPSY. It is often extremely difficult to decide whether operations for epilepsy should be done. Auerbach² thinks only those cases can be considered in which failure to improve has been observed after suitable bromide treatment and abstinence from alcohol, and he includes in this list the cases of Jacksonian as well as idiopathic epilepsy. Those persons who have inherited epilepsy, or are the offspring of drunkards, are not suitable for operation. As regards the Jacksonian type of epilepsy, Auerbach believes the danger from operation to be slight and that convulsions are not made worse by the operation; therefore, he advises trephining in every case of Jacksonian epilepsy. Decided increase of the attacks in number and beginning mental failure are indications for operation in Jacksonian epilepsy. Youth is more favorable than advanced age, and beyond

¹ Boston Medical and Surgical Journal, March 5, 1914, p. 337.

² Section of Neuropathology, Proceedings of the XVIIth International Congress of Medicine.

the age of forty years operation is contraindicated. In idiopathic epilepsy, indications are the existence of an aura as in one limb, interparoxysmal or postparoxysmal unilateral symptoms, severe head injury or early encephalitis or transitory limitation of the attack to one side. These seem like clearly defined indications, but they are clouded by Auerbach in his statements that we must not expect too much from surgery in the treatment of epilepsy; we must not forget the epileptic predisposition, the possibility of multiple lesions, that focal symptoms sometimes are misleading and Jacksonian epilepsy has led to mistaken diagnoses. Cases of status hemiepilepticus have existed in which lesions could not be found at necropsy.

In the discussion of this paper, Anton remarked that he had seen choked disks, resulting from the deformity known as *Thurmschädel*, disappear after puncture of the corpus callosum.

Poussepp expressed himself pessimistically as regards operation for epilepsy, and yet he has treated fifty-three cases of epilepsy surgically within the last three years. Surgery has not justified the hopes formerly entertained, and it becomes constantly more evident that most cases are not benefited by operation and recovery occurs only in a limited number of cases, even though lesions may have been found.

Biro expressed himself much in the same manner, especially in relation to idiopathic epilepsy.

Paralysis Agitans was not regarded by Charcot as a hereditary disease, but more extensive observation has shown that several members of a family may have this disease, and Günther¹ has recently studied a family in which it was hereditary. It may be associated with rheumatic pains and deformities of the extremities like those of chronic rheumatism, but there are no changes within the joints, no destruction of bone, and no ankylosis. X-rays may show moderate atrophy of bone which could be caused by inactivity and cachexia.

Myotonia Atrophica. We have very little evidence that myotonia atrophica may result from trauma; indeed, few have suggested such a possibility, but Tetzner² believes that although trauma cannot be asserted with certainty as a cause of this disorder, it must be regarded as an exciting cause for a small number of cases of Thomsen's disease and a still greater number of myotonia atrophica. The trauma must not be too slight and the first symptoms must have appeared not later than nine or twelve months.

Tonic Spasms Occurring on Voluntary Movement. An extraordinary form of family spasm is described by J. Rülff.³ The description of one case may answer in a considerable degree for the others. The attack began with tonic spasm of the right foot, this spread up the leg and trunk

¹ Deutsch. Zeitschrift f. Nervenheilkunde, vols. xlvii and xlviii, p. 192.

² Ibid., vol. xlv, No. 6, p. 436.

³ Archiv f. Psychiatrie, vol. lii, No. 2, p. 748.

and into the upper limb, and at times implicated the mouth and tongue. It developed especially when the man wished to make a voluntary movement, as in rising suddenly from his chair, and at this moment a sudden inhibition occurred and he would be unable to move from the spot. Unconsciousness was not present. The spasm sometimes developed when he attempted to play the piano, especially if he were excited; the hands remained in a rigid position, somewhat flexed, and the arms were adducted. He could prevent the attack sometimes when it began in the foot by pressing on his foot with his cane or squeezing it with his hand. Most attacks were right-sided. The young man was neurotic. The father of this family and three of his children had these peculiar attacks. One son had clonic, as well as tonic, spasms. There seems to have been only one other case similar to these reported in the literature. Rülff compares the attacks with writers' spasm, which they resembled in the onset on intended movement, but they were not exactly the same. The explanation cannot be given satisfactorily, and yet the spasms could not be regarded as hysterical.

Family Dysostosis Beginning at Puberty. Under this designation Anton¹ describes a very interesting family disorder. The parents in the family he studied escaped. They had ten children, of whom six sons and three daughters lived beyond childhood. The oldest son was normal in bodily development; the second son committed suicide because of deformity of the vertebral column and increasing weakness. The four remaining sons developed kyphoscoliosis at the period of puberty. Two of these had ataxia and disturbed gait of cerebellar type. One was imbecilic. One daughter had slight kyphosis, another had severe kyphosis and scoliosis and some ataxia. The third daughter was of normal shape. Thus, of nine children, seven developed kyphoscoliosis at the period of puberty, and four were ataxic. In four, the deformity was progressive. Röntgen photographs of the vertebral column showed that the condition resembled osteomalacia. Rickets was considered but dismissed because of the integrity of the long bones, the progressive course, the localization in the vertebral column, and the absence of a tendency to recovery. The normal bony development until the period of puberty in these cases was remarkable.

In hereditary or familial dysostosis, chondrodystrophy is an important type, but the growth of the long bones in length is affected in this and the trunk escapes. The type that Anton describes has most resemblance to the dysostose cléidocrânienne of Marie and Sainton.

Anton thinks the development of the deformity at the period of puberty in his cases indicates some anomalous condition of the polyglandular apparatus. Some of the males showed hypergenitalismus, and the women had delayed menstruation. The thyroid gland in all was poorly developed.

¹ Archiv f. Psychiatrie, vol. liv, No. 1, p. 76.

Enuresis Nocturna in children and young adults is usually a functional disorder, but Fuchs, in Vienna, has stated that it may have an organic basis and is dependent upon a condition he has called myelodysplasia, *viz.*, a rudimentary spina bifida. Other symptoms will be found if searched for. This view of Fuchs has been received with a certain amount of skepticism and the confirmation of it in at least one case by Alfred Saenger¹ shows that myelodysplasia may be the cause of enuresis in a small number of cases. Saenger's patient was a girl, aged eighteen years, who had wet the bed many years, but she could control her bladder during the day. The right Achilles reflex failed, and diminution of all forms of sensation was found about the anus in the distribution of the third, fourth, and fifth sacral roots. The *x*-ray showed a defect in the sacrum.

Family Disease of Nervous System. There are peculiar forms of family nervous disease which are difficult to classify. Where, for example, shall we place the cases described by Frenkel and Dide?² Three sisters in one family presented a symptom-complex of acquired pigmentary retinitis, papillary atrophy, mental symptoms, cerebellar ataxia, and convulsions. The symptoms began at the age of seven or eight years. The authors themselves are uncertain as to what name they shall give to their complex. The juvenile form of amaurotic idiocy is rejected because the development was normal in early childhood and this, therefore, is not idiocy, and the children were not of the Jewish race. There was not the extreme muscular hypotonicity with exaggeration of the reflexes, nor the peculiar macula.

Treatment of Tetanus. The treatment of tetanus has been far from satisfactory. Ashhurst and John³ have made a careful study of this subject. The treatment they say comprises four indications. The care of the wound, both as a prophylactic and as a curative measure, is most important. The neutralization of the toxin, by the rational use of antitoxin, is indispensable; and these authors have demonstrated the inadequacy of the dosage usually employed for subcutaneous administration, and the necessity of intraneural, intraspinal, and probably also of intravenous injections. The use of carbolic acid injections has been serviceable and the remedy is more readily obtainable than antitoxin. The third indication, to depress the functions of the spinal cord, must not be met to the exclusion of the foregoing. Unless, in addition to the intraspinal injections of magnesium sulphate, antitoxin be employed in a rational manner, nothing is done to aid the body tissues to withstand the onslaught of the disease. Finally, the care of the patient, nursing and feeding, is the most practical part of the

¹ Deutsch. Zeitschrift f. Nervenheilkunde, vols. xlvii and xlviii, p. 694.

² Revue Neurologique, June 15, 1913, p. 729.

³ American Journal of the Medical Sciences, July, 1913, p. 77.

treatment, and one without which all the other parts may fail of their effect.

These authors would treat a case of tetanus as follows: The patient should be kept quiet with competent nursing facilities. As soon as possible after coming under observation, whether this be in the small hours of the night or in the day, the motor nerves leading from the wounded part should be exposed, as near to the cord as practicable, and as much antitoxin as each will contain should be injected toward the spinal cord. For wounds of the sole of the foot, it is sufficient to inject the sciatic nerve; for those of other parts of the lower extremity, not only the sciatic but the anterior crural and obturator nerves should be injected. For wounds of any part of the upper extremity, the brachial plexus should be exposed above the clavicle, and an injection should be made into each of its cords. These operations should be done under general anesthesia, preferably chloroform. A strong linen ligature is to be looped loosely around each of the nerves exposed; the ends of these ligatures are to be left long and used to identify the nerves and draw them up into accessible positions for the purpose of subsequent injections of antitoxin should these be necessary.

An intraspinal injection of at least 3000 units should then be made according to the usual technique for spinal anesthesia. If it be possible to prick the cord with the needle, so much the better to do so. There might, however, be danger of intramedullary hemorrhage from this procedure. The wound of entrance of the infection should then be widely opened, all foreign bodies, sloughs, etc., should be removed by forceps, scissors, or scalpel; the wound should be irrigated with hot peroxide of hydrogen, swabbed out with 3 per cent. alcoholic solution of iodine, and loosely filled with gauze soaked in the same solution, and an injection of antitoxin should be made (1500 to 3000 units) deeply into the muscular tissues around the wound. Continuous proctoclysis, as used in cases of peritonitis, should be given; and, by mouth or in the rectal fluid, effective doses of chloral and bromides should be administered at appropriate intervals. Feeding should be enforced by the nasal tube passed under chloroform anesthesia if necessary. During the course of the first day, a moderate amount of antitoxin should be administered intravenously; probably 10,000 units.

The intraneural and intraspinal injections of antitoxin should be repeated daily, under chloroform anesthesia, until marked decrease in spasticity occurs. Every twelve hours, or less often, a moderate amount of antitoxin should be injected intravenously, or even subcutaneously, so as to neutralize the circulating toxins, but the main reliance should be placed on intraneural and intraspinal injections. The administration of spinal depressants should be continued so long as they are indicated; a comatose state, and muscular relaxation are contra-indications. The wound should be dressed daily until a healthy granulating surface is obtained.

Ashlurst and John believe that when this treatment has been commenced within twelve hours of the first appearance of symptoms of tetanus, the mortality of the disease should not be over 20 per cent. Because of the importance of this statement, it has seemed advisable to give the treatment in detail.

Family Periodic Paralysis. The characteristic features of this peculiar affection, as usually manifested, are periodicity, flaccid motor paralysis, loss of electrical irritability, loss of deep reflexes, and between the attacks, relatively perfect health. L. Pierce Clark¹ has studied a family in which the paralysis differs from this type. There were four generations known, consisting of nineteen members, of whom nine showed the transient palsy. The severe attacks are characterized by a more or less complete and abrupt inability to move any of the voluntary muscles. These attacks occur at irregular intervals of days, weeks or months. The condition is an inhibition rather than a palsy, and there are no electrical changes, no alterations in the deep or superficial reflexes during the attacks, and the muscular tonus is not altered during the attacks. Sensibility is not demonstrably altered. There is, in some instances, implication of muscles innervated by cranial nerves, as the ocular muscle, tongue, pharynx, lips and respiratory muscles (dyspnea).

The earliest case known in this family is that of the great grandfather. The five female children of the second generation were affected, while the four males escaped. The two females of the third generation were affected while the one male escaped. In the fourth generation the oldest member is five years, and the disorder appears as yet in but one female member of the six children. It apparently originated in the great grandfather, but the disease transmitted by him has occurred exclusively in the female members of the several generations. The male members have not been without the suspicion of a certain hereditary taint, as two have had diabetes.

Late Infantile Amaurotic Family Idiocy. Bielschowsky² describes a form of amaurotic family idiocy which begins later than the usual type and yet not so late as the juvenile type described by Spielmeyer and Vogt, in 1905. Blindness, paralysis, and dementia developed gradually. Clinically and pathologically, the cases were related to cerebellar hereditary ataxia. The children were three in number and had the same parents. No evidence of syphilis could be obtained, but epilepsy existed in the families of both parents. The family was Christian. The symptoms began in all three children in the fourth year, previously all three were supposedly healthy except that talking was delayed, and yet examination was not made by a physician. The first sign was epileptic convulsions; then occurred failure of intelligence, becoming idiocy in the second year of the disease. The blindness

¹ Review of Neurology and Psychiatry, September, 1913.

² Deutsch. Zeitschrift f. Nervenheilkunde, vol. 1, Nos. 1 to 4.

began toward the end of the second year, resulting from optic atrophy and atrophic orange-colored spots in the retina. The white spot with red centre in the macula, so characteristic of the Tay-Sachs form, was not seen. The gait became spastic and ataxic, and finally all voluntary movement was impossible.

The findings in two cases after death were like those of amaurotic family idiocy, but showed a resemblance also to those of hereditary cerebellar ataxia. They help to support the view that a relation exists between most hereditary diseases of the central nervous system.

Treatment of Drug Habits. Alexander Lambert's¹ treatment for alcohol, morphin and other drug habits has aroused much interest. He has recently given his experience gained during the four years since the publication of his first paper. It is desirable that the patient should be in a hospital and not in his own home. The essentials of the treatment, which cannot be altered, are the persistent administration of the belladonna mixture in small doses and the thorough elimination by means of some form of mercury as a cathartic. This practically means some form of blue mass or calomel, either given in the form of compound cathartic pill or alone. Some patients who cannot take calomel without being salivated can take blue mass. The cholagogue action is essential. The mere clearing out of the intestinal tract is not sufficient. Often calomel in divided doses can be advantageously substituted for the compound cathartic pills. If the stools about the fortieth hour become clay colored, some form of ox-gall preparation is useful. The mixture Lambert recommends is:

	Gm. or c.c.	
R—Tincture belladonnæ	62	5ij
Fluidextracti xanthoxyli,		
Fluidextracti hyoseyami	5ā 31	5j

In making this mixture, a 15 per cent. tincture of the belladonna must be used or an equivalent amount administered if a weaker tincture of belladonna is used. If this is not done, the craving for the drug often remains as a nagging longing. Lambert thinks it necessary that the mixture should be given to the beginning physiological tolerance of the belladonna, as shown by dry throat, dilated pupils or even a flushing and a rash, or the beginning incisive voice of the commencing belladonna hallucinations, though the last-mentioned symptom is to be avoided if possible. It is essential that the mixture should be given persistently in small doses and not by the teaspoonful, three times a day. It is also essential that the morphin patient, before starting the treatment, should have a thorough cathartic action. It is well to give three-fourths of the total twenty-four-hour dose instead of two-thirds

¹ Journal of the American Medical Association, June 21, 1913, p. 1933.

as the initial dose of morphin. The method in detail consumes so much space that the original article must be consulted by those interested.

Lambert's experience with the treatment is that 11 per cent. of the morphinists and 12 per cent. of the alcoholics return for treatment. Doubling this percentage we still have 75 per cent. as remaining free from addiction. Of these, the percentage of those known to have stayed free is high.

Ischemic Lumbago. Under this designation, Hunt¹ has described an affection characterized by a painful spasm of the muscles in the lumbar region following the exertion of walking or standing, which disappears promptly after a brief period of rest. It is an intermittent claudication of the lumbar region, and may be bilateral or unilateral. The recurrence of the symptoms regularly during muscular action and their prompt cessation during rest, Hunt says, are characteristic of this type of pain; the blood-supply being sufficient in the passive state, but not equal to the increased demands during activity, with the resultant pains, cramps, and weakness in the affected muscles. Hunt thinks there is a relationship between the arteriosclerosis of the lumbar aorta and the intermittent weakness, stiffness, and pains in the lumbar region occurring in advanced life. It is a senile type of backache of vascular origin in which the symptoms are not so clearly defined as in the ischemic lumbago, but still dependent on a defective blood-supply, and is promptly relieved by the recumbent posture or rest in a chair. In ischemic lumbago, the pain or painful cramp is in the muscles of the lumbar region and is limited above by the twelfth rib and below by the crest of the ilium. When severe, the pain may radiate as far laterally as the midaxillary line. The painful area is not tender to pressure, except after prolonged exertion. The pain is characterized by its intermittent character and absolute dependency on muscular exertion.

Ankle Clonus as a Sign of Functional Disease. Tileston's² study of ankle clonus is important because the sign is frequently sought for in organic nervous disease. He concludes that ankle clonus indistinguishable from the genuine may be found more or less frequently in a variety of conditions without accompanying organic nervous disease, such as: (a) acute infectious diseases, especially typhoid; (b) chronic infections associated with marked toxemia, especially pulmonary tuberculosis in the third stage; (c) uremia shortly before and during the acute uremic seizure; (d) epilepsy immediately after the convulsion; (e) intoxication from certain drugs, *e. g.*, hyosein, ether, and chloroform; (f) excessive fatigue; (g) exceptional cases of certain neuroses, *viz.*, neurasthenia, hysteria, paralysis agitans; (h) psychoses in the stage of excitement; (i) chronic articular rheumatism.

With the exception of joint disease, a toxic action on the nervous

¹ Journal of the American Medical Association, February 28, 1914, p. 671.

² American Journal of the Medical Sciences, July, 1913, p. 1.

system may be assumed in all these states as the underlying factor in the production of clonus. This, Tileston thinks, is obvious in infectious diseases and drug intoxications; in uremia, epilepsy, and undue fatigue, the presence of toxic products of metabolism may be regarded as probable, though not yet demonstrated, and even in hysteria and neurasthenia the action of toxic products in severe cases cannot be excluded.

In articular rheumatism, a constant spinal irritation from the inflamed joint tissues is the probable cause.

Clonus caused by toxic states usually may be distinguished from that of organic nervous disease by the absence of spasticity and of other signs pointing to organic disease, and especially by the absence of the Babinski and Oppenheim signs, but an exception to this rule is seen after the use of hyoscin in medicinal doses and immediately after the epileptic attack, in both of which instances these signs may be present.

The occurrence of ankle clonus is of prognostic value in uremia, preceding at times the acute seizure. Ankle clonus usually disappears a few days before death; otherwise its disappearance usually indicates an improvement in the patient's condition.

INDEX.

A

ALDERHALDEN'S serodiagnosis of tuberculosis, 19
 test for pregnancy, 165
 Abdominal hernia, 254
 pregnancy with a living child, 206
 wall, hematoma of, labor complicated by, 226
 Abducens nerve, paralysis of, from middle-ear disease, 315
 Abortion, 232
 artificial, lessened birth rate and its relation to, 238
 complicated by fever, treatment of, 234
 criminal, in ectopic pregnancy, 238
 efforts to produce, through a mistaken diagnosis in pregnancy, 239
 with fever, bacteriology of, 232
 habitual, relation between, and internal secretions, 232
 production of, sterilization of tubes and, 234
 Abortive treatment of typhoid, 93
 Acidosis, respiratory study of, 54
 Acromegaly, 298
 Acromial breathing, 54
 Acute pulmonary edema, 67
 Adenitis, epidemic cervical, with cardiac complications, 57
 Age, influence of, upon complications produced by, 231
 Albuminuria, is it likely to occur in successive pregnancies, 193
 Alopecia, thallium, 129
 total, 113
 treatment of, 114
 Anemias, grave, surgical cure for, 102
 oxygen starvation for, 55
 pernicious, due to α -rays, pathology of, 101
 etiology of, 101
 severe, and their treatment, 98
 spleen in etiology of, 102
 splenic, chronic, Banti's disease, and, 100
 and vitiated air, 55
 Aneurysm, aortic, wiring and electrolysis for, 104
 Ankle clonus as sign of functional disease, 329
 Anterior crural neuritis, 318
 Anteroposterior position of head at pelvic brim complicating labor, 227

Antisepsis, obstetric, 243
 Aorta, perforation of, by foreign bodies, 104
 Apoplexy, 292
 Appendicitis complicating pregnancy, 192
 Argyll-Robertson pupil in syringomyelia, 314
 in tabes, 303
 Arterial spasm, 106
 Arteriosclerosis, 102
 Arteriosclerotic optic atrophy, 317
 Artery, pulmonary, 105
 Ascites, aut drainage of, 63
 Asphyxia, clinical study of, 72
 stillbirth, treatment of, 69
 treatment of, 68
 bronchotetany and, 72
 Asthma, adrenalin in, 74
 epinephrin in, 73
 thymic, α -rays for, 59
 vaccine therapy for, 72
 Atheroma, calcium in genesis of, 103
 electric treatment of, 103
 medicinal treatments of, 103
 from psychic and mental over stress, 103
 Truncceek's new physical sign of, 103
 Atmocaustis, influence of, upon subsequent pregnancy, 202
 Atonic atasic type of infantile cerebral paralysis, 290
 Atrophy, Charcot-Marie, with spasticity, 314
 of hand from localized neuritis, 319
 optic, arteriosclerotic, 317
 Aural reflex and bathing fatalities, 88
 Auscultation, 52
 Autoserotherapy in serofibrinous pleurisy, 61

B

BACTERIA, importance of, in vagina before labor, 172
 Bacteriology of abortion, with fever, 232
 Basic fuchsin in chronic ulcerative dermatitis, 121
 Benzol in leukemia, 100
 Binasal hemianopsia in tabes, 303
 Birth fractures, further observations upon, 273
 rate, lessened, and its relation to artificial abortion and sterilization, 238
 Blighted pregnancy, 188

Blood, calcium in, in pregnancy, 176
 during pregnancy, 175
 -forming organs, danger of penetrating rays for, 98
 -letting apparatus for infants, 95
 in pregnancy and labor, 176
 -pressure, 105
 optic estimation of, 108
 in relation to hydrocarbons during pregnancy, 175
 -storage therapy, 92
 systolic and diastolic estimation of, 105
 Bloodvessels, 102
 anastomosis, 98
 Bradycardia, recovery from, 92
 Brain, diseases of, 279
 tumor, 279
 improvement in, 282
 from lumbar puncture in, 282
 macropsia from, 284
 mistaken diagnosis in, 280
 necrosis of, following decompression, 283
 simulating apoplexy or hydrocephalus, 280
 tonic perseveration in, 283
 Breathing, acromial, 54
 Bronchitis, chronic, 71
 autotherapy by sputum extract, 72
 dehydration treatment for, 71
 inoculation therapy for, 72
 vaccine therapy for, 72
 Bronchopneumonia in children, 68
 Bronchotetany in adults, 73
 asthma and, 72
 Brown-Séquard paralysis, 308
 Bulbar paralysis in typhoid fever, 289
 Bülov's treatment for empyema, 61

C

CALCIUM in blood in pregnancy, 176
 in genesis of atheroma, 103
 Cancer of skin, radium and, 135
 Carbon-dioxide output, proportion of, to total pulmonary ventilation in emphysema, 56
 Cardiac energy index, 89
 remedies and treatment, 90
 Carrel's heart experiments, 79
 Caudal lesions simulating tumor, 309
 Cerebellar localization, 291
 Cerebral cortex, segmental representation of limbs in, 296
 hemorrhage, decompression in, 293
 syphilis, early, 290
 Cerebrospinal fluid in cases of spinal tumor, 310
 in mumps, changes in, 300
 Cerebrum in newborn, function of, 288
 Cervical lacerations, 231
 Cervix, dilatation of, during labor, method of diagnostic degree of, without internal examination, 229

Cervix, stricture of, rupture of membranes and, 211
 Cesarean section, 255
 in Russia, 259
 self-inflicted, 259
 Chancre of lip, 153
 Charcot-Marie atrophy with spasticity, 314
 Chest in disease, comparative measurements of two sides of, 45
 Children, prematurely born, subsequent development of, 268
 skin diseases of, 115
 Cholera complicating pregnancy, 201
 Chorio-epithelioma complicating pregnancy, treatment of, 197
 Chronic splenic anemia, Banti's disease and, 100
 Coin sound, 52
 Coli-cardiac syndrome, 109
 Colutrin in uterine inertia, 276
 Convulsions Jacksonian, tonic preliminary stage in, 282
 Cord, umbilical, fetal death due to knot in, 268
 labor complicated by rupture of, 230
 Coronary vessels, reaction of, to poisons, 103
 Cranial nerves, multiple neuritis of, 316
 Crural neuritis, anterior, 318
 Cyst of pineal gland, removal of, 286

D

DANGER of penetrating rays for blood-forming organs, 98
 Decompression in cerebral hemorrhage, 293
 Dermatitis, ulcerative, chronic, basic fuchsin in, 121
 Dermatology, 113
 new serum treatment in, 140
 Development of prematurely born children, 268
 Diabetes complicating pregnancy, 179
 Diagnosis between spinal tumor and meningomyelitis, 310
 Diaphragmatic breathing, exclusive, 67
 Digitalis and blood-pressure, 110
 Diseases, of brain, 279
 functional, ankle clonus as sign of, 329
 of nerves, 315
 of nervous system, 279
 of spinal cord, 301
 Disinfection, methods of, in first stage of labor, 229
 Division of posterior roots of spinal cord for pain, 308
 Does pituitrin injure child, 271
 Drug habits, treatment of, 328
 Ductus arteriosus, patent, physical diagnosis of, 105

Duration of pregnancy, 171
 Dysidrosis, 119
 Dysostosis, family, beginning at puberty, 324

E

ECLAMPSIA, 180
 after rupture of uterus and total
 extirpation, 195
 Ectopic gestation, 204
 inflammation as cause of, 205
 treatment of, 209
 pregnancy, multiple, bilateral and,
 206
 Edema, pulmonary, acute, 67
 Electrocardiograph in study of preg-
 nancy, 171
 Electrocardiography leads and waves, 84
 Embolism, thrombosis and, following op-
 eration and childbirth, 216
 Emetin in hemoptysis in phthisis, 70
 Emphysema, carbon dioxide output in, 56
 essential, 75
 treatment of, 75
 Empyema, Bülow's treatment for, 61
 Endocarditis, acute, treatment of, 90
 Enuresis nocturna, 325
 Epidemic meningitis, treatment of, 299
 Epilepsy, 319
 migraine and, 322
 operations for, 322
 and paresis in engineers, 320
 psychic, 319
 tuberous sclerosis in, 321
 Epinephrin in asthma, 73
 Ergot, 276
 Exophthalmic goitre, thymectomy in, 59
 Experimental multiple sclerosis, 314
 Extraction with Küstner's blunt hook,
 252
 Extramembranous pregnancy, 207

F

FACIAL palsy, 316
 congenital, 317
 Family disease of nervous system, 325
 dysostosis beginning at puberty, 324
 form of syringomyelia, 313
 idiocy, infantile amaurotic, late, 327
 periodic paralysis, 327
 Fear and ataxia, 301
 Ferments, transudation of, as novel vas-
 cular function, 20
 Fetal death due to knot in umbilical cord,
 268
 Fever in tabes, 302
 Fibroid tumors complicating labor, 227
 pregnancy complicated by, 200
 Fibroma molluscum of pregnancy, glands
 of internal secretion in genesis of, 194
 Forceps, intra-uterine application of,
 during labor, 211

Forceps, obstetric, 239
 jointed, 241
 use of, in private practice, 211
 Fractures, birth, further observations
 upon, 273
 intra-uterine, 269
 Friedmann cure and its status in Ger-
 many, 26
 tubercle emulsion, 26
 Function of cerebrum in newborn, 288
 Functional disease, ankle clonus as sign
 of, 329

G

GALVANIZATION to induce labor, 218
 Gasserian ganglion, tumor of, 286
 Gestation, ectopic, 204
 treatment of, 209
 Glands of internal secretion in genesis of
 fibroma molluscum of pregnancy, 194
 Glandutrin as uterine stimulant, 275
 Glycosuria with pituitary tumors, 286
 Goitre, exophthalmic, thymectomy in,
 59
 Graves' disease and thyroidectomized
 woman's instead of goat's milk, 60

H

HEAD, transverse position of, at pelvic
 brim, 242
 Heart action, 84
 -block, treatment of, 91
 and diaphragm, condition of, during
 pregnancy, 176
 diseases complicating pregnancy, 177
 energy index, 89
 experiments, Carrel's, 79
 pregnancy complicated by disease of,
 203
 function, cough-dilatation time as
 measure of, 89
 massage for stillborn infants, 69
 reflexes, 88
 surgery, 80
 testing methods, 89
 tests, 89
 Hematoma of abdominal wall, labor com-
 plicated by, 226
 epidural, in spinal canal of newborn,
 272
 of vulva complicating labor, 227
 Hematuria complicating pregnancy, 180
 Hemianopsia, binasal, in tabes, 303
 Hemianoptic pupillary sign, 300
 Hemoptysis, artificial pneumothorax in,
 64
 Hemorrhage, cerebral, decompression in,
 293
 from ruptured uterine veins, labor
 complicated by, 224
 subarachnoid, spontaneous, 294
 Hemothorax, 61

Hernia, abdominal, 254
 Hydatidiform mole, 188
 Hydrocephalus, 291
 Hyperthyatism, 58
 Hypophysis, extract of, in uterine atony, 276
 Hypotension, in association with a definite symptomatology, 109
 in bloodvessels, 109
 from hyperthermia, 110
 Hypotensive subject, 109
 Hypotensor pituitary principles, 110

I

Idiocy, family, late infantile amaurotic, 327
 Ileus, postoperative, 252
 pregnancy, labor, and puerperal period complicated by, 198
 Immunity of tolerance, 18
 Immunology of pregnancy, 172
 Impetigo circinata, 117
 Infantile amaurotic family idiocy, late, 327
 pseudobulbar paralysis, 289
 Infants asphyxiated, treatment of, infant pulmotor for, 274
 mortality in first weeks of life, 274
 Infection of kidneys during pregnancy, 189
 pulmonary, earliest seat of, 18
 septic, puerperal, 263
 Inflammation as cause of ectopic gestation, 205
 Internal secretions and diseases of skin, 127
 "Intestinal" bradycardias, 109
 Intra-abdominal pressure in pregnancy, 176
 Intradural injection of neosalvarsan, 305
 Intra-uterine application of forceps during labor, 211
 fracture, 269
 Iodine, influence of, upon pathological metabolism, 41
 in metabolism and therapeutics, 34
 Ischemic lumbago, 329

K

KIDNEYS, pregnancy and diseases of, 189
 test of function of, by phenolsulphonephthalein, 173
 Küstner's blunt hook, extraction with, 252

L

LABOR, 210
 after antefixation by operative means, 223
 anteroposterior position of head at pelvic brim complicating, 227

Labor, complicated by hematoma of abdominal wall, 226
 by hemorrhage from ruptured uterine veins, 224
 by rupture of umbilical cord, 230
 by sudden death, 212
 with air embolism, 213
 complications of influence of age upon, 231
 produced by, 231
 dangers of, after operative antefixation, 261
 fibroid tumors complicating, 227
 first stage of, methods of disinfection in, 229
 hematoma of vulva complicating, 227
 importance of bacteria in vagina before, 172
 induced, result of, in a pelvis of moderate contraction, 250
 induction of, by stimulation of uterine contraction, 218
 obstacle to, by distention of fetal urinary bladder and rupture, 230
 obstructed, treatment of, 232, 255
 sequelæ of, 262
 treatment of, in contracted pelvis, 210
 use of dilating bag in, complicated
 by fibroid tumors, 250
 of elastic bag in, complicated by fibroid tumor, 228
 Lepers, what shall we do with our, 133
 Leprosy, 133
 Leukemia, acute, 101
 benzol in, 100
 secondary, 100
 symptomatic, 100
 Lip, chancre of, 153
 Localization, sensory, 297
 Luetin reaction in syphilis, 157
 Lumbago, ischemic, 329
 Lumbar puncture in brain tumors, 282

M

MACROPSIA from brain tumor, 284
 Membranes, rupture of, and stricture of cervix, 211
 Meningitis, epidemic, treatment of, 299
 spinalis serofibrosa circumscripta, traumatic form of, 312
 tuberculous, with recovery, 299
 Meningocerebellar symptom-complex in diseases with fever in tuberculous children, 300
 Meningomyelitis, diagnosis between spinal tumor and, 310
 Method of diagnosing degree of dilatation of cervix during labor without internal examination, 229
 of disinfection in first stage of labor, 229
 Middle-ear disease, paralysis of abducens nerve from, 315

- Midwifery, necessity of recognizing, as branch of surgery, 254
 Migraine and epilepsy, 322
 Miscellaneous nervous diseases, 319
 Mortality, infant, in first weeks of life, 274
 Movements of two sides of chest in disease, comparative measurement of, 45
 Multiple neuritis of cranial nerves, 316
 sclerosis, experimental, 314
 Mumps, changes in cerebrospinal fluid in, 300
 Muscular rigidity, pseudoparalytic, of waking state, 295
 Myotonia atrophica, 323

N

- NECROSIS of brain tumor following decompression, 283
 Neosalvarsan, intradural injection of, 305
 Nerves, diseases of, 315
 Nervous diseases, miscellaneous, 319
 system, diseases of, 279
 family disease of, 325
 Neuralgia of twelfth thoracic nerve simulating visceral lesions, 317
 Neurasthenia of immigrants, 110
 Neuritis, anterior crural, 318
 localized, atrophy of hand from, 319
 multiple, of cranial nerves, 316
 Newborn, 267
 acute tetany in, 273
 cerebrum in, function of, 288
 epidural hematoma in spinal canal of, 272
 fracture of skull in, immediate treatment of, 274
 natural nourishment of, 268
 subdural bleeding in, aspiration of fontanelle for, 267
 Nipples, care of, during pregnancy, 200
 Nitrogen displacement and oxygen replacement, 63
 Nourishment of newborn, 268
 Nutrition of mother during pregnancy, 171

O

- OBSTETRIC antisepsis, 243
 forceps, 239
 jointed, 241
 measures for preserving life of child, 269
 operations, 254
 pharmacology, 275
 practice, problems of, 254
 surgery, 239
 Oculocardiac heart reflex, 88
 Open-air healing, 55
 Operations for epilepsy, 322
 Ophthalmic neonatorum in London, 274
 Optic atrophy, arteriosclerotic, 317
 thalamus and corpora quadrigemina,

- Optic thalamus, tumors of, 284
 Organs, internal, syphilis of, 154
 Ovarian pregnancy with full-time fetus, 208
 tumors complicating pregnancy and labor, treatment of, 197
 Oxygen starvation for anemia, 55
 sub-cuten for nervous and mental affections, 56

P

- PALPATION, 44
 mediate, 45
 special technique in, 44
 subphrenic, localizing, 44
 Palsy, facial, 316
 congenital, 317
 Pantopon as uterine stimulant, 218
 Paralysis of abducent nerve from middle-ear disease, 315
 agitans, 323
 Brown-Séquard, 308
 bulbar, in typhoid fever, 289
 cerebral, infantile, atonic atasic type of, 290
 periodic, family, 327
 pseudobulbar, infantile, 289
 of spinal accessory nerve, 315
 Parasymphilis, 301
 Paresis, epilepsy and, in engineers, 320
 spirochæta pallida in, 304
 Parturition, most favorable age for, 171
 Patellar reflexes in old age to be distinguished from diabetic reflexes, 303
 Pellagra, changing views of, 134
 Pelvis, contracted, treatment of labor in, 210
 enlargement of, by resection of promontory, 242
 Percussion, 47
 of pulmonary apices, 48
 Pericardial affections, 81
 effusions, latent transient, 82
 skialogy, 84
 Pericardiolysis, 92
 Pericarditis, adhesive, 81
 Peritonitis, localizing, of puerperal origin, 266
 Pertussis, 74
 adrenalin in, 75
 Pharmacology, obstetric, 275
 Photo-activity of serum, induced, 99
 Phthisis, treatment of, by intensive nascent iodine, 38
 Pineal gland, cyst of, removal of, 286
 Pituglandol, as uterine stimulant, 218
 Pituitary tumors, 284
 glycosuria with, 286
 Pituitrin, does it injure child, 271
 influence of, upon child, 218
 as uterine stimulant, 218, 275
 Pleural effusions, 63
 Pleurisy, serofibrinous, autoserotherapy in, 61
 shoulder-pain in, 61

- Pleximeter principle, 50
quantitative, 47
- Pneumonia, auscultatory method in, use of, 107
of infants, hypostatic paravertebral, 68
- Pneumothorax, artificial, 63
artificial in hemoptysis, 64
in laryngeal tuberculosis, 65
for early lung hemorrhage, 65
influence of, upon blood, 65
value of therapeutical, 63
- Postoperative ileus, 252
- Pott's disease, reflexes of defence in, 312
- Pregnancy, Abderhalden's test for, 165
abdominal, with a living child, 206
affections of urinary tract in, 179
appendicitis complicating, 192
art in, 200
blighted, 188
blood in, 175
calcium in, during, 176
in relation to hydrocarbons during, 175
care of nipples during, 200
changes in metabolic viscera caused by, 173
cholera complicating, 201
chorio-epithelioma complicating, treatment of, 197
complicated by disease of heart, 203
by fibroid tumors, 200
by retention of gauze tampon in uterus, 195
condition of heart and diaphragm during, 176
diabetes complicating, 179
diagnosis of, by serum reaction, 165
diseases of heart complicating, 177
of kidneys, 189
duration of, 171
ectopic, bilateral and multiple, 206
criminal abortion in, 238
electrocardiograph in study of, 171
extramembranous, 207
fibroma molluscum of, glands of internal secretion in genesis of, 194
glycosuria in, 179
hematuria complicating, 180
immunology of, 172
influence of atmocausis upon subsequent, 202
intra-abdominal pressure in, 176
labor and blood-pressure in, 176
ovarian tumors complicating, treatment of, 197
and puerperal period complicated by ileus, 198
menstruation, and corpus luteum, relation between, 196
nausea of, pernicious, relation between, and acute, yellow atrophy of liver, 185
nutrition of mother during, 171
ovarian, with full-time fetus, 208
psychoses of, and parturition, 194
pyelitis of, 180
- Pregnancy, pyelitis of, treatment of, 180
pyelonephritis of, 189
in rudimentary cornu of uterus and unicornis, 204
simultaneous, in both tubes, 207
suprarenal capsules during, 192
at term in accessory horn of a uterus bicornis, 208
tetany complicating, 201
toxemia of, 180
and engorgement, 184
and tuberculosis, 185
urine in, clinical significance of, 172
Wassermann reaction in, 194
- Pressor and depressor agents, 110
- Prophylaxis of serous adhesions, 62
- Pseudobulbar paralysis, infantile, 289
- Pseudoparalytic muscular rigidity of waking state, 295
- Psychic epilepsy, 319
- Psychoses of pregnancy and parturition, 194
- Pubiotomy, 244
- Puerperal auto-infection, sources and avenues of, 265
infection from use of tampons to cheek hemorrhage, 249
period, 262
septic infection, 263
- Pulmonary artery, 105
infections, earliest seat of, 18
silicosis, 31
- Pupil, Argyll-Robertson, 303
in syringomyelia, 314
rebounding, 302
- Pyelitis of pregnancy, 180
treatment of, 180
- Pyelonephritis of pregnancy, 189

Q

QUININE as uterine stimulant, 275

R

- RADIOGRAPH of tracheobronchial adenopathies, 57
- Radium and cancer of skin, 135
in spinal tumor, 311
treatment of mediastinal tumors, 60
- Reaction of coronary vessels to poisons, 103
- Rebounding pupil, 302
- Reflexes of defence in Pott's disease, 312
in tumor of spinal cord, 308
- Regeneration of elastic fibers in arteries after injury, 103
- Removal of cyst of pineal gland, 286
- Respiratory gaseous exchanges, 54
study of acidosis, 54
- Rheumatic fever, intravenous treatment of, 90
- Rhinophyma and decortication, 137
- Riva-Rocci method of estimating blood-pressure, 107

S

SALICYLIC ionization, 81
 Sanatorium, tuberculosis, 28
 Scalenotomy for apex tuberculosis, 66
 Sclerosis, multiple, experimental, 314
 Scoliosis, respiratory treatment of, 56
 Secalecornin in postpartum hemorrhage, 276
 Segmental representation of limbs in cerebral cortex, 296
 Semile presentations of disease, 111
 Sensory disturbances of thalamic lesions, 297
 localization, 297
 Sequelæ of labor, 262
 Serodiagnosis of tuberculosis, Abderhalden's, 19
 Serum, fetal, 276
 treatment, new, in dermatology, 140
 Sign, pupillary, hemianopic, 300
 Silicosis, pulmonary, 31
 Skin, cancer of, radium and, 135
 connection between mediastinal glands and, 129
 mesenteric glands and, 129
 parathyroid glands and, 129
 thyroid gland and, 128
 diseases among American Indians, 125
 of children, 115
 and internal secretions, 127
 striations, 204
 Skull, depressed fracture of, in newborn, immediate treatment of, 274
 Spasm, arterial, 106
 tonic, occurring on voluntary movement, 323
 Spasticity, Charcot-Marie atrophy with, 314
 Speech centres in right cerebral hemisphere in right-handed people, 287
 Sphygmomanometer, Nicholson's pocket, 108
 Spinal accessory nerve, paralysis of, 315
 cord, diseases of, 301
 division of posterior roots of, for pain, 308
 tumor of, 308
 reflexes of defence in, 308
 Spirochæta pallida in tabes and paresis, 304
 Spleen, surgery of, 102
 in etiology of anemia, 102
 Splenectomy, its indications and its results, 99
 for pernicious anemia, 99
 Sputum, 54
 albumin in, estimation of, by potassium ferrocyanide, 54
 Stethoscope, adjustable, 52
 Strophanthus by inhalation, 90
 Subarachnoid hemorrhage, spontaneous, 294

Sugar in urine in pregnancy, 179
 Suprarenal capsules during pregnancy, 192
 Surgery, obstetric, 239
 Surgical treatment of brachial birth palsy, 271
 Symphysiotomy, 244
 Syphilis, 153
 cerebral, early, 290
 diagnosis of, by examination of blood from placental site and umbilical vein, 199
 of internal organs, 154
 luetin reaction in, 157
 Syphilitic wrist-drop, 308
 Syringomyelia, Argyll-Robertson pupil in, 314
 family form of, 313

T

TABES, 301
 Argyll-Robertson pupil in, 303
 binasal hemianopsia in, 303
 fever in, 302
 spirochæta pallida in, 304
 Test, Abderhalden's, for pregnancy, 165
 of function of kidneys by phenol-sulphonaphthalein, 173
 Tetanus, treatment of, 325
 Tetany, acute, in newborn, 273
 complicating pregnancy, 201
 Thalamic lesions, sensory disturbances of, 297
 Thallium alopecia, 129
 Thinning treatment by electric muscular stimulation, 92
 Thoracotomy, prepericardial, 92
 Thoracoplasty, 66
 Thrombosis and embolism following operation and childbirth, 216
 pelvic, septic, surgical treatment of, 266
 Thymectomy in exophthalmic goitre, 59
 Thymus, 58
 death, 269
 Thyreoglandol as uterine stimulant, 220
 Thyroid extract as uterine stimulant, 220
 gland and integument, connection between, 128
 tumor with vertebral metastasis, 311
 Tobacco blood-pressure question, 111
 influence of, upon pregnant women, 202
 Tonic perseveration in brain tumor, 283
 preliminary stage in Jacksonian convulsions, 282
 spasm occurring on voluntary movement, 323
 Toxemia of pregnancy, 180
 Transfusion, 93
 direct, 95

- Transfusion forceps, a vein-to-vein, 96
 intramuscular direct, 96
 by means of glass cylinders, 97
- Transverse position of head at pelvic
 brim, 242
- Traumatic form of meningitis spinalis
 serofibrosa circumscripta, 312
- Treatment of abortion complicated by
 fever, 234
 of acute endocarditis, 90
 of asphyxia, 68
 of asphyxiated infants, infant pul-
 motor for, 274
 of atheroma, electric, 103
 medicinal, 103
 of chorio-epithelioma complicating
 pregnancy, 197
 of drug habits, 328
 of ectopic gestation, 209
 of emphysema, 75
 of epidemic meningitis, 299
 of heart-block, 91
 of hemoptysis, 70
 in phthisis, emetin in, 70
 of labor in contracted pelvis, 210
 of obstetric labor, 255
 of obstructed labor, 232
 of ovarian tumors complicating preg-
 nancy and labor, 197
 of phthisis by intensive nascent
 iodine, 38
 of puerperal streptococcemia with
 intravenous injections of magne-
 sium sulphate, 266
 of pyelitis of pregnancy, 180
 of rheumatic fever, intravenous, 90
 of stillbirth asphyxia, 69
 surgical, of brachial birth palsy,
 271
 of septic pelvic thrombosis, 266
 of tetanus, 325
 of total alopecia, 114
- Tubercle, its etiology of cystic neoforma-
 tions connected with, 18
- Tubercular heredosyphilis, 160
- Tuberculin, 20
 for prophylaxis, 25
 results, contribution to, 21
 Sahli's views on, 20
 statistics of, 22
 treatment as essential method of
 dispensing sanatorium benefit, 24
- Tuberculosis, 17
 Abderhalden's serodiagnosis of, 19
 apex, scalenotomy for, 66
 complement-fixation test for, diag-
 nostic value of Besredka's etiology
 of, 17
 Friedmann cure for, 26
 laryngeal, artificial pneumothorax in,
 65
 and sanatorium, 27
 morbid anatomy of, 17
 pregnancy and, 185
 vaccine for, Bruschetti's, 34
 weight chart, daily, in, 27
 treatment of, intensive iodine, 33
- Tuberculosis, treatment of, medical, 32
 meningitis with recovery, 299
- Tuberous sclerosis in epilepsy, 321
- Tumor of brain, 279
 macropsia from, 284
 improvement in, 282
 from lumbar puncture in,
 282
 mistaken diagnosis in, 280
 necrosis of, following decom-
 pression, 283
 simulating apoplexy or hydro-
 cephalus, 280
 tonic perseveration in, 283
 fibroid, complicating labor, 227
 pregnancy complicated by, 200
 of Gasserian ganglion, 286
 mediastinal, radium treatment of,
 60
 of optic thalamus and corpora quad-
 rigemina, 284
 pituitary, 284
 of spinal cord, 308
 caudal lesions simulating,
 309
 cerebrospinal fluid in, 310
 diagnosis between, and men-
 ingomyelitis, 310
 treated by radium, 311
- Tuning-fork and stethoscope in estima-
 tion of abdominal and thoracic
 viscera, 53
- Typhoid fever, abortive treatment of, 93
 bulbar paralysis in, 289

U

- UMBILICAL cord, fetal death due to knot
 in, 268
- Urinary tract, affections of, in pregnancy,
 179
- Urine in pregnancy, clinical significance
 of, 172
 sugar in, in pregnancy, 179
- Uterine contractions, stimulation of, and
 induction of labor, 218
 veins, ruptured, hemorrhage from,
 complicating labor, 224
- Uterus bicornis, pregnancy at term in
 accessory horn of a, 208
 gauze tampon in, pregnancy compli-
 cated by retention of, 195
 rupture of, eclampsia after, and total
 extirpation, 195
 unicornis, pregnancy in rudimentary
 cornu of, 204

V

- VACCINE therapy for chronic bronchitis,
 72
 for tuberculosis, Bruschetti's, 34
- Vaporole as uterine stimulant, 218

Vascular suture, 98
Vena cava, 104
 inferior, pulsation of, 104
 superior, rupture of aneurysm
 into, 104
Venesection, 93
 present position of, typhoid fever
 and, 93
Viburnum, in dysmenorrhea, 276
Viscera, isolated, as an experimental
 pharmacological field, 81
Vividiffusion, 80
Vulva, hematoma of, complicating labor,
 227

W

WASSERMANN reaction, 304
 in pregnancy, 194
 results, 161
Whooping cough, 74
 diagnosis of, by complement-devia-
 tion test, 74
 early local treatment of, 75
Wrist-drop, syphilitic, 308

X

X-RAYS for thymic asthma, 59

NEW (5th) EDITION

JUST READY

HARRINGTON'S PRACTICAL HYGIENE

This new edition (the fifth) of Harrington's standard work on hygiene will maintain it in the forefront of the literature on its subject. This pre-eminence it won by reason of its high authority, its exceptional clearness and its adaptation to the needs of all readers: students, physicians, sanitarians, quarantine officials, building and factory inspectors, school boards, military and naval medical officers, architects and food analysts. The features which characterized the earlier editions, and which won the hearty endorsement of all readers have been continued in this thoroughly revised issue.

A MANUAL OF PRACTICAL HYGIENE. By **CHARLES HARRINGTON, M.D.**, late Professor of Hygiene, Harvard Medical School. Revised by **MARK W. RICHARDSON, M.D.**, Secretary, Massachusetts State Board of Health.

Octavo, 933 pages, with 125 engravings and 24 plates.

Price, in cloth binding, \$5.00, net.

NEW (4th) EDITION

JUST READY

BALLENGER ON THE NOSE, THROAT AND EAR

The distinguishing feature of this new edition will be found in its chapters on the Labyrinth. Great labor has been bestowed in marshalling the facts and formulating them for teaching purposes. Thirteen original colored plates now illustrate the physiological and pathological manifestations of nystagmus. A careful study of these alone will suffice to convey a clear idea of the subject. Every line of the book has been revised, all obsolete matter has been eliminated, and much new text has been incorporated, with many new illustrations and plates.—*From the Preface.*

DISEASES OF THE NOSE, THROAT AND EAR, MEDICAL AND SURGICAL. By **WILLIAM LINCOLN BALLENGER, M.D.**, Professor of Otolaryngology, College of Physicians and Surgeons, Chicago.

Octavo, 1,080 pages, with 536 engravings, mostly original, and 33 plates.

Price, in cloth binding, \$5.50, net.

MAIN OFFICE
706-8-10 Sansom St.
PHILADELPHIA

LEA & FEBIGER
PUBLISHERS

N. Y. OFFICE
2 W. 45th Street
NEW YORK

NEW WORK

JUST READY

SURGERY

Its Principles and Practice

FOR STUDENTS AND PRACTITIONERS

By **ASTLEY P. C. ASHHURST, A.B., M.D., F.A.C.S.**

INSTRUCTOR IN SURGERY IN THE UNIVERSITY OF PENNSYLVANIA; ASSOCIATE SURGEON
TO THE EPISCOPAL HOSPITAL; ASSISTANT SURGEON TO THE PHILADELPHIA
ORTHOPÆDIC HOSPITAL AND INFIRMARY FOR NERVOUS DISEASES

LARGE OCTAVO, 1141 PAGES, WITH 7 COLORED PLATES AND 1032
ILLUSTRATIONS, MOSTLY ORIGINAL, IN THE TEXT

CLOTH, \$6.00, NET

The talented author has already won recognition as being among the world's leading surgeons. He combines in exceptional degree a philosophic grasp of the principles, experience in the practice of all branches of surgery, and exhaustive familiarity with the literature of the whole field. Reflecting such qualifications his book will be promptly recognized on its merits as the leading text for students, and the ideal guide for all those who have practical surgery to do. The author's marked literary ability has enabled him to present clear and accurate statements of facts, to emphasize the underlying principles, to elucidate pathology and diagnosis, to give the indications for treatment, and to complete the whole with adequate descriptions of operations. Of the wonderful series of over 1000 illustrations, mostly original, each one is chosen for the information it conveys. The reputation gained by the author's standard monograph on **Fractures of the Elbow** is well sustained in his chapters on Fractures and Dislocations, and on Diseases of the Bones and Joints. Genito-Urinary Surgery, Gynecology and Orthopedics, subjects not usually included in works on Surgery, are discussed so far as required by the general surgeon. In short, **Ashhurst's Surgery** is a new comprehensive and authoritative work of the highest importance, the coming text-book for students, and the ideal guide for general practitioners and surgeons.

MAIN OFFICE
706-8-10 Sansom St.
PHILADELPHIA

LEA & FEBIGER
PUBLISHERS

N. Y. OFFICE
2 W. 45th Street
NEW YORK